CLINICAL RESOURCES AVAILABLE
ON THE ORTHOPAEDIC UNIT
AT MASS. GENERAL HOSPITAL

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A STUDY OF THE CLINICAL RESOURCES AVAILABLE ON THE ORTHOPAEDIC UNIT OF THE MASSACHUSETTS GENERAL HOSPITAL FOR THE BASIC CLINICAL EXPERIENCE OF THE PROFESSIONAL NURSE

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Chapter I

THE PROBLEM

Introduction

More and more nursing educators are attempting to make sound plans for the education of the professional nurse by applying the scientific method to determine ways to improve good health teaching and all nursing.

To date there is no objective evidence of the clinical resources available for professional nursing practice in the Orthopaedic Department of the Massachusetts General Hospital. Therefore, the writer has initiated a study of this hospital's clinical resources in the Orthopaedic Unit, which, it is hoped, will serve as a basis for planning a long range program which will provide the professional nurse with opportunities for adequate clinical instruction, observation and practice in the field of Orthopaedic Nursing according to modern standards.

In considering the scope of this study the importance of the part that the principles of Posture and Body Mechanics play in the field of Orthopaedic Nursing has not been overlooked. The writer strongly feels that since every person is a potential patient with an orthopaedic problem that these principles should not be part and parcel of Orthopaedic Nursing alone but should be inherent in all nursing situations.

Therefore it is assumed that these principles are given in the fundamental science courses and that practical applications of these principles are made in the Introduction to Nursing so the student nurse has become familiar with the importance of good posture and body mechanics as a sound basis not only for the prevention of acquired functional and structural deformities but also for the maintenance of her patients' and her own positive health and efficiency.

It is axiomatic that hospital resources control nursing education because the most important element of this field rests on the provision of clinical material, adequate in variety and amount, and available for teaching purposes. The kind and amount of clinical resources are never more important than the use which is made of those which are available for teaching. Their educational effectiveness depends largely on the quality of their organization and supervision. Probably this is the reason why it is so difficult to discover any statistical studies of basic requirements in relation to orthopaedic clinical resources set up by The American Board of Orthopaedic Surgery, Inc., the American Medical Association's Council On Medical Education And Hospitals, and the American College of Surgeons. Each organization suggests that the amount of clinical resources must be broadly stated because of the many different practices of hospital administrators and

orthopaedic surgeons in relation to various types of treatment throughout the country and lack of standardization. Nevertheless, it is the writer's feeling that one must know that which is available before one can analyze the situation, make effective comparisons, come to reasonable conclusions and make helpful recommendations concerning plans or revisions in the present Orthopaedic Nursing program.

Limitations of this Study

Of necessity a study of this magnitude must be delimited. The following limitations are worthy of mention:

1. It is understood that the present needs of the industrial area in which this hospital is situated should be examined as well as the prevalency and frequency of community diseases in connection with a study such as this. This was not done.

2. The extent to which supplementary facilities elsewhere in the hospital or its associated agencies are available to fulfil the requirements of the professional nurse's experience in Orthopaedic Nursing should be examined. This was not made part of this study.

3. While the overall clinical resources of the Orthopaedic Out-Patient Department were studied in relation to the amount available they should also be surveyed in relation to type and variety. This was not contained in this study.

4. An Orthopedic Operating Room Experience Study and an Emergency Ward Experience Study might also be done as another step in evaluating the total Orthopaedic Nursing situation. This was not included as a part of the Study.

5. The report of the Department of Physical Medicine (see page 146) suggests that there is certainly need for analysis of the activities being carried on there since it suggests that some of the nursing activities which are not available on the

Orthopaedic Unit are in operation there. (See page 162.) This was not attempted in this study.

6. The year 1948 was considered a "stable" year to make this study since it was a "post-war" year, the medical staff had recevered its pre-war and revised method of organization and administration, the new Chief of the Department had two years experience to his credit. Many comparisons were made in relation to the "war year" 1945. Yet it might have been better to also have reviewed and compared findings with a pre-war year - 1940. This was not done.

Chapter II

FINDINGS

Data Assembled

Since the first aim of this study is to determine the clinical resources in the Orthopaedic Unit at the Massachusetts General Hospital, it seemed necessary that the following data be gathered and interpreted:

I The Hospital - overall description

A. The School of Nursing

II The Orthopaedic Department

A. Brief history to the present day

B. Divisions within the department and the allied Department of Physical Medicine which offer care to patients with an orthopaedic problem

III The Orthopaedic Unit of the General Hospital

A. Overall description

1. Physical pattern

2. Types of patients admitted in general

3. Services admitting these patients

IV Clinical Resources Within the Orthopaedic Unit of the General Hospital

(Year - 1948 with spot checking in the years 1945, 1946)

A. Types

1. Non-classified

a. Amount

(1) Admissions (totals and average)

(a) yearly

(b) monthly

(c) seasonal

b. Census

(1) daily average (adult and children)

c. Patient Days Treatment

d. Patient Days Stay

e. Sex Incidence

f. Age Grouping

g. Patients Undergoing Operations

2. Classified According to

a. Admitting Service (Orthopaedic or Fracture)

(1) Admissions

(a) yearly

(b) monthly

(2) Census

(a) daily average (adult and children)

(3) Sex Incidence

(4) Number of Surgical Operations Performed

(5) Type of Operations Performed on Patients Admitted by These Services.

3. Classified According to

Cause of Orthopaedic Condition

(Method of classification)

a. Amount

(1) Admissions

(2) Patient Days Stay (total and average)

3A Classification #I - Patients Admitted With Orthopaedic Conditions Due To Prenatal Influences

a. Amount

(1) Admissions (yearly, monthly, seasonal)

b. Type

c. Age Grouping

d. Surgical Operations Performed

3B. Classification #II - Patients Admitted With Orthopaedic Conditions Due to Infections

a. Amount

(1) Admissions (yearly, monthly, seasonal)

b. Types

c. Age Grouping

d. Surgical Operations Performed

3C. Classification #III - Patients Admitted With Orthopaedic Conditions Due To Trauma and Physical Agents

a Amount

(1) Admissions (yearly, monthly, seasonal)

b Types

c Age Grouping

d Surgical Operations Performed

3 D. Classification #IV - Patients Admitted With Orthopaedic Conditions Due To Disorders of Metabolism, Growth or Nutrition

a Amount

(1) Admissions

b Type

c Surgical Operations Performed

3 E. Classification #V - Patients Admitted With Orthopaedic Conditions Due To New Growths

a Amount

(1) Admissions

b Type

c Age Grouping

d Surgical Operations Performed

3. F. Findings and Interpretation of Data Concerning Patients With Conditions Due To All Other Causes - Including Unknown and Uncertain Causes.

a Amount

(1) Admissions (yearly, monthly, seasonal)

b Type

c Age Grouping

d. Surgical Operations Performed

IV Clinical Resources in the Orthopaedic Out-Patient Department

A Types

1 classified according to location of Clinic

(1) Regular

(a) Orthopaedic

(2) Special

(a) Anterior Poliomyelitis

(b) Scoliosis - Posture

(c) Cerebral Palsy

(d) Miscellaneous

(3) Follow-up

(a) Fracture

(4) End-Result

(a) Fracture

(b) Orthopaedic

(c) Special Orthopaedic

B Amount

1 Admissions

a yearly

2 Patient visits

a Initial

b Repeat

c Referral

V Clinical Resources Within the Department of Physical Medicine

A Types

1 Classified according to

a admission for therapy

(1) physical

(2) occupational

b referring agent

(1) hospital division

(2) hospital service

B Amount

1 admissions

a yearly

VI Clinical Resources in the Emergency Ward

A Types

1 non-classified

B Amount

1 Admissions

a yearly

FINDINGS AND INTERPRETATION OF DATA ASSEMBLED CONCERNING

I The Hospital

The Massachusetts General Hospital, the third oldest private hospital in America and the oldest in New England is owned by a voluntary corporation. A board of twelve trustees operate this one hundred twenty year old institution.

Today, the Massachusetts General Hospital provides care for adults and children who are acutely ill with general medical and surgical diseases.

"The Hospital naturally divides itself into four parts: the General Hospital wards of 524 beds; the Phillips House, the private pavilion of ninety-four beds and twenty-two bassinets; the Baker Memorial, the building for people of moderate means, now open to a capacity of 349 beds and thirty-four bassinets; and the Out-Patient Department with average daily clinics of 758 patients. During the year just closed the first three named departments have cared for over 28,900 patients, and the Out-Patient Department, with its forty-two clinics, has cared for over 229,000 patients' visits."[1] A total bed capacity for 1,023 patients and a daily average patient census of 847 was recorded during the year 1948.

1 The School of Nursing of the Massachusetts General Hospital, Announcement for 1949 and 1950. Boston: The Hospital, 1949, p. 18.

This Hospital is one of the principal teaching units of the Harvard University Medical School with which there is an affiliation for undergraduate instruction and graduate training.

"The medical staff is organized and consists of active, consulting, honorary and courtesy groups, the latter having privileges for the care of private patients in Baker and Phillips units. There is a chief of the medical staff and two chiefs of the surgical staff with appropriate groups and divisions within each department. They are responsible with the medical director for all the professional activities of the institution. The chiefs of service and a number of additional members of the active staff hold teaching positions on the faculty of the medical school.

The Hospital has a well organized clinical laboratory and a department of pathology under the supervision of a full time pathologist. There are several assistants in the department and an adequate technical staff. Special research laboratories are maintained in connection with the work of the various clinical services. At least sixty-four per cent of all deaths have post-mortem examinations with complete protocols on file. The x-ray department with complete diagnostic and therapeutic equipment is supervised by a full time radiologist who has several assistants. The facilities of the undergraduate basic medical science laboratories and special research laboratories

of the Harvard University Medical School are made available to selected members of the resident staff for special collateral study.

The hospital maintains an excellent library with 16,000 bound volumes and 129 subscriptions to current medical journals and periodicals with a full time librarian in charge.[1]

These facts make evident the existence of the Hospital's extensive over-all clinical resources available for the teaching of all those concerned with its purpose for being--the promotion of health and the care of the sick.

A. The School of Nursing. An integral part of the Massachusetts General Hospital is the School of Nursing which has passed its seventy-fifth birthday. "The aim of the school is to set up a program by means of which the student will learn to give intelligent and skilled nursing care, to teach others the principles and practices of health, to function intelligently as a health worker in the community, to maintain her own physical and mental health and to develop her own capacities as an individual"[2]

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1 American College of Surgeons, Directory of Graduate Training Programs in General Surgery and The Surgical Specialties in Hospitals of The United States and Canada, Chicago: The College, 1946, p. 161

2 The School of Nursing of The Massachusetts General Hospital Announcement for 1949 and 1950 Boston: The Hospital, 1949, p. 20

In 1940, the Massachusetts General Hospital School of Nursing was surveyed and fully accredited by the National League of Nursing Education. The school is accredited in Massachusetts and New York.

II The Orthopaedic Department.

The hospital has contained within it the departments of surgical specialties among which is one called "Orthopaedic". Since the latter is one of the chief concerns of this paper, it warrants further discussion and description.

A. Brief History To The Present Day. Although it has been well known that Boston was a leader in demonstrating the necessity requirements for specialized training and special techniques in the field of Orthopaedics, the conservative Massachusetts General Hospital was a little reluctant to admit the advisability of a separate unit for the care of those handicapped by conditions of the musculo-skeletal system. The patients with such conditions were usually cared for by surgeons as a part of General Surgery.

Very probably the rapid progress in orthopaedic medical-surgical specialization throughout the country and especially at The Children's Hospital in Boston, was responsible for guiding the Staff to see the need for creating a separate department in Orthopaedics. In 1900 the Trustees received from the Medical Board a recommendation that the position of

Consulting Orthopaedic Surgeon be established. Dr. Joel E. Goldthwait was duly appointed to that post. Three years later (1903) an Orthopaedic out-patient department was opened. This department contained an operating room, examining and waiting rooms. (This department is still in the same location.)

In 1907 a separate Orthopaedic Ward was opened for which Dr. Goldthwait had raised seventy thousand dollars ($70,000.) This had a capacity of eighteen beds for adults and space for four children's cribs. The Sterilizing, Operating and Plaster Rooms were in the basement.

In that same year, 1907, facilities were added for the administration of heat, massage and hydrotherapy. Previously, there had been a department of meshano-therapy and electro-therapy. This, of course, was the nucleus of the present Department of Physical Medicine.

The Surgical Appliance Shop, now known as the Brace Shop which had been in existence since 1900, then began to supply to the patients with orthopaedic difficultues such apparatus as leather jackets, flat foot plates, leather spicas, foot and leg braces.

The General Executive Committee of the Hospital in 1912 reported five years after its establishment that the Orthopaedic Department was caring for the following types of cases in general; "diseases of the joints, particularly tuberculosis of

the spine, hip, knee, etc.; the chronic multiple joint affections, congenital deformities and acquired deformities of paralysis; static conditions of the feet; and affections of the spine, such as scolioses and postural defects....."[1]

Because there were so many physically handicapped following the anterior poliomyelitis epidemic of 1916 a special clinic was instituted for the care of 115 children. So encouraging were the results of the follow-up care of these patients that the Orthopaedic Department started a program in co-operation with the Harvard Poliomyelitis Commission to continue and expand this type of service.

Dr. Robert B. Osgood developed the so-called Fracture Service (which is still in operation) between 1919-1922.

In 1926 Dr. William A. Rogers set up in operation a follow-up system which was, and still is, of tremendous value in determining the end-results of surgical treatment. Following operations, the patients were asked to return to the Hospital after a one year period had elapsed for evaluation of their treatment.

In 1929 Dr. Smith-Peterson, internationally noted for his outstanding contributions to Orthopaedic Surgery was appointed Chief of the Orthopaedic Department.

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1 Washburn, Frederic A. The Massachusetts General Hospital: Its Development, 1900-1935, Boston, Houghton Mifflin Company, 1939, p. 330

In the Annual Report of 1930 of the Orthopaedic Department there is reference to the Posture and Scoliosis Clinic and its progress.

During the third decade of this century it was the trend of the times for more and more participation by the Government in the interest of the health of the people of the Commonwealth. Hence, the Massachusetts State Department of Health, well aware of the Massachusetts General Hospital's research work for the treatment of the patient with arthritis granted enough money to support twenty patients who had arthritis in General Hospital beds and, in addition, provide for the necessary laboratory study. This grant from the State continues. It has been offered yearly to the Hospital since 1936 to the present day.

During the recent "War Years" the Orthopaedic Unit continued as best it could with four-fifths of its Medical Staff responding to the emergency call to military duty.

The year 1940 marked the opening of the Department of Physical Medicine so closely allied with the Orthopaedic Department.

Late in 1946 to the regret of all concerned with the Hospital, Dr. Smith-Peterson resigned as Chief of the Department and was succeeded by Dr. Joseph Barr, a man with broad vision and experience in his chosen field of specialization--- Orthopaedic Surgery.

As of March 29, 1948, this Department of Orthopaedics was approved by the American Medical Association's Council on Medical Education and Hospitals as adequate in diagnostic, therapeutic and teaching facilities for a three years residency training area for the care of children and adults with orthopaedic disabilities and fractures.

It is hoped that these few "highlights" may serve to give one an overall picture of the background for the present set-up of this clinical surgical specialty at the Massachusetts General Hospital.

B. The Orthopaedic Department Today

Care is available to patients suffering from diseases and disabilities of the musculo-skeletal system in the following divisions of the Massachusetts General Hospital.

Service	Location
In-Patient	1. Phillips House-Private Pavillion No segregation of orthopaedic patients. 2. Baker Memorial-Semi-Private No segregation of orthopaedic patients. 3. General Hospital-Wards A. Unit - Segregation of orthopaedic patients. B. Accident Ward
Follow-Up	Out-Patient Department Clinics 1. Anterior Poliomyelitis 2. Arthritic 3. Fracture 4. Hand 5. Orthopaedic

6. Plastic
7. Podiatry
8. Scoliosis and Posture
9. Tumor

End-Result	Out-Patient Department Clinics 1. Arthritic Surgery 2. Fracture 3. Orthopaedic 4. Slipped Epiphysis
Physical Therapy and Occupational Therapy	Department of Physical Medicine 1. For in-patients 2. For out-patients
Social Service	Social Service Department 1. For in-patients 2. For out-patients

III The Orthopaedic Unit in the General Hospital

A. Overall description

1. Physical Pattern.

The Orthopaedic Unit of fifty-two beds, which occupies a separate floor, is departmentalized and segregated. The Unit is divided into two sections: A-C and B. Section A-C has a total capacity of twenty-eight beds. There is a sixteen bed and an eighteen bed ward (cubicle units) plus four single rooms. Section B has a total capacity of twenty-four beds. There is a sixteen bed ward (cubicle units) and four single rooms. There are no special beds for children in either section. Female patients are usually found on Section A-C and male patients on Section B.

The Chief Social Worker for the Unit has her office on this separate floor. There is Blood Chemistry and Urinalysis Laboratory also. This Unit is equipped with special beds, splints, frames, standard orthopaedic tables, a well-equipped plaster room, and an orthopaedic appliance room containing walkers, crutches, bicycles, roller skates, and the like.

2. Types of Patients Admitted. In general, it may be said that the types of cases which are usually admitted to this Orthopaedic Unit are those patients who are in need of correction of congenital and acquired deformities and those who require treatment of fractures and other disorders, acute or chronic, which interfere with the proper normal functioning of the musculo-skeletal system and its associated structures.

3. Services Admitting Patients. At the present time two Services admit patients to this Orthopaedic Unit. They are known as the Orthopaedic Service and the Fracture Service. It is the policy of the Orthopaedic Service to admit children and adults who need hospital care because of conditions of the musculo-skeletal system due to all other causes except those patients who have suffered a fracture. Children and adults who are diagnosed as "fracture" are admitted by the Fracture Service.

If the diagnosis is not clear cut in the beginning or an accessory diagnosis complicates the situation, there may be slight changes in the above policy.

IV Findings and Interpretation of Data Concerning Clinical Resources Within the Orthopaedic Unit of the General Hospital During the Year 1948 With Spot Checking During the Years 1945, 1946 and 1947.

A. Total overall picture in relation to clinical resources (non-classified)

1. Amount

The total number of patients admitted to the Orthopaedic Unit of the General Hospital in the year 1948 was 588. The total number of admissions during each of the following years, 1945, 1946 and 1947 exceeded the number of patient admissions in 1948. (See TABLE 1 , page 25.) The average of the total admissions for these four years was 625.25 patients. The number of patients admitted each month during 1948 ranged from forty-three to sixty-one patients. (See TABLE 2 , page 26) The average number of admissions per month was forty-nine patients. The variation in range of the total monthly admissions during the other three years (1945, 1946, and 1947) when compared to those of 1945 was not significant when considered in proportion to the number of yearly total admissions.

A distribution of the total number of patients admitted in 1948 according to seasonal variation showed that the greatest number was admitted during the third quarter of the year.

This was also true during the years 1945 and 1946. (See TABLE 3 , page 27.) Very often there is decrease in the number of hospital admissions during the third quarter of the year (July, August and September) because of summer vacations which may result in reduction of the number of professional and lay personnel available for patient care. On the other hand, since so much of orthopaedic surgery is elective, the patients may choose this time for admission so that their vacation may be used more "profitably" in the hospital. More children might also be admitted during this time to prevent interruption of their educational program during the school year.

TABLE 1.

TOTAL NUMBER OF PATIENTS ADMITTED

TO THE ORTHOPAEDIC UNIT

YEARS 1945 - 1948

Year	Number of Patients Admitted
1948	588
1945	613
1946	617
1947	683

Source: Annual Reports, Daily Census Reports and Orthopaedic Department Records of the Massachusetts General Hospital

TABLE 2.

DISTRIBUTION OF THE NUMBER OF PATIENTS ADMITTED

MONTHLY TO THE ORTHOPAEDIC UNIT

YEARS 1945 - 1948

	Number of Patients Admitted			
Date	1945	1946	1947	1948
January	43	56	79#	50
February	47	49	52	44
March	66#	37	70	54
April	36	37	60	49
May	56	46	52	47
June	59	49	58	49
July	61	73#	60	48
August	60	53	71	61#
September	49	64	54	48
October	50	50	40	43
November	50	54	37	54
December	36	49	50	51
Totals	613	617	683	588

Greatest number of hospital admissions during the year specified.

Source: Orthopaedic Service Records and Daily Census Reports of the Massachusetts General Hospital.

TABLE 3.

DISTRIBUTION OF THE NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT ACCORDING TO SEASONAL VARIATIONS

YEARS 1945 - 1948

Year	Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	148	145	157 #	138
1945	156	151	170 #	136
1946	142	132	190 #	153
1947	201 #	170	186	127

Greatest number of patients admitted to the hospital in the year specified.

Source: Computed from figures in Table 2 , page 26 .

b. Census

There is bed capacity for fifty-two patients on this Unit and in 1948 there was a daily average patient census of 43.18 or one might say eighty-two per cent of the bed capacity was utilized. (See TABLE 4 , page 29.) Further census study revealed that the daily average adult census was 40.68, and the daily average patient census of children was 2.50. Therefore the census of children comprises only 5.8 per cent while the adult census makes up the remaining 94.2 per cent (See Table 4 , page 29.) Further, there were two periods during the year when there were no children as patients for fifty-four successive days - a twenty-nine day period from April 9 to May 7 and a twenty-five day period from December 8 to January 1,1949.

Examination of the clinical resources in the Pediatric Unit of the Hospital shows that occasionally a child with an orthopaedic condition was admitted. Its yearly admission count for 1948 was a total of seven children. This does not represent a very worthwhile addition to the already low children patient census.

TABLE 4.

DAILY AVERAGE PATIENT CENSUS

(ADULTS AND CHILDREN) ON THE ORTHOPAEDIC UNIT

YEAR 1948

Patients	Daily Average Number	Patient Census Per Cent
Adults	40.68	94.2
Children	2.50	5.8
Total	43.18	100

Source: Daily Census Reports of the Massachusetts General Hospital

c. Patient Days Treatment (See TABLE 5, page 31, and Figure I, page 32.)

There was a yearly total of 15,907 patient days treatment. Nine hundred and eighteen (918) or 5.8 per cent were children patient days treatment and 14,988 or 94.2 per cent were adult patient days treatment. Monthly distribution of patient days treatment also shows a sharp contrast between adult and children patient days treatment. (See TABLE 5, page 31.) In fact during the month of December there were 1203 adult patient days treatment and only six children patient days treatment.

TABLE 5.

MONTHLY DISTRIBUTION OF PATIENT DAYS TREATMENT

(ADULT AND CHILDREN) ON THE ORTHOPAEDIC UNIT

YEAR - 1948

Date	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	1183	1157	1321	1326	1230	1247	1376	1279	1253	1217	1197	1203
Children	79	73	49	13	44	84	75	133	154	113	95	6
Total	1262	1230	1370	1339	1274	1331	1451	1412	1307	1330	1292	1209

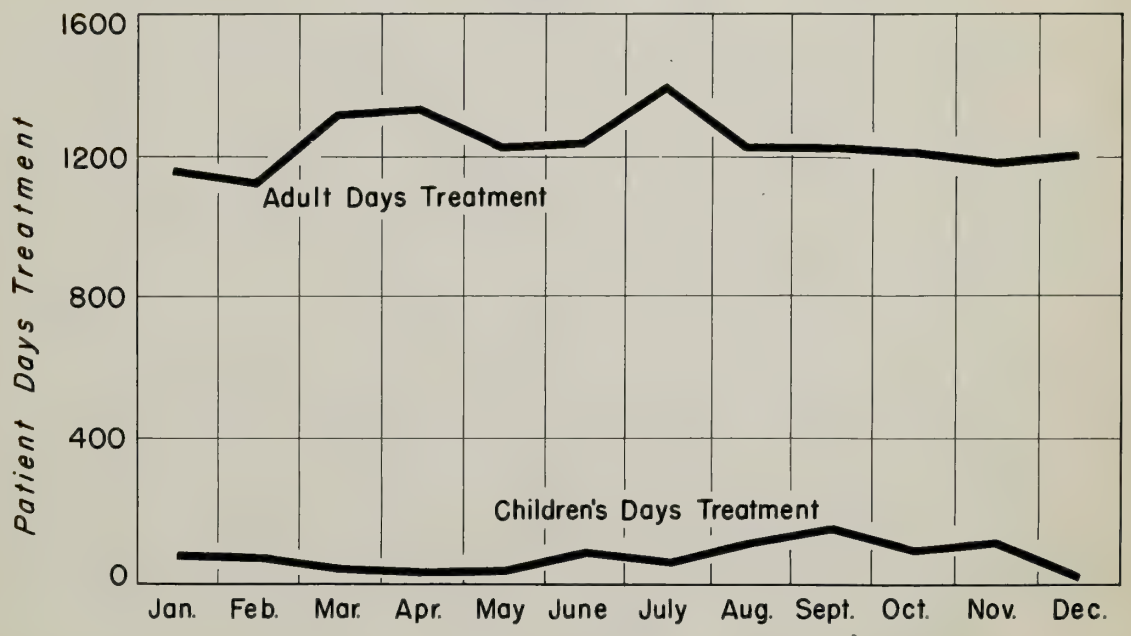

DISTRIBUTION OF PATIENT DAYS TREATMENT
(ADULTS AND CHILDREN)
ORTHOPAEDIC UNIT, MASSACHUSETTS GENERAL HOSPITAL
1948
Patient Days Treatment
1600
1200
800
400
0
Adult Days Treatment
Children's Days Treatment
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

Figure I

d. Patient Days Stay

There was a wide variation in patient days stay so much so that evidence of extensive further study concerning this matter will be found later on in this study. The average patient days stay of those patients admitted during 1948 was 24.29 and the average patient days stay in 1945 was 25.28. It is of some significance that the comparison of patient days stay in these two years was not too different. (See Table 6, page 34.)

TABLE 6.

COMPARISON OF AVERAGE PATIENT DAYS STAY OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT

YEARS 1945 and 1948

Year	Number of Patients Admitted	Average Patient Days Stay
1948	588	24.29
1945	613	25.28

Source: Computed from records of patients on the Orthopaedic Unit of the Massachusetts General Hospital

e. Sex Incidence

Comparison of the sex of those patients admitted in 1948 with the sex of those admitted in 1945 proves that in both years more females were admitted than males. The difference is not sufficient to merit any special mention. (See TABLE 7, page 36, and Figure II, page 37.)

TABLE 7.

DISTRIBUTION OF AMOUNT OF MONTHLY ADMISSIONS TO THE ORTHOPAEDIC UNIT ACCORDING TO SEX.

YEARS 1945 and 1948

Date	Patients Admitted			
	1948		1945	
	Male	Female	Male	Female
January	19	31	21	22
February	17	27	20	27
March	25	29	23	43
April	24	25	24	12
May	24	23	23	33
June	23	26	34	25
July	20	28	29	32
August	20	32	28	32
September	25	23	34	15
October	15	28	24	26
November	24	30	24	26
December	28	13	17	19
Totals	273	315	301	312

Source: Daily Census Report and Patient Records of the Massachusetts General Hospital.

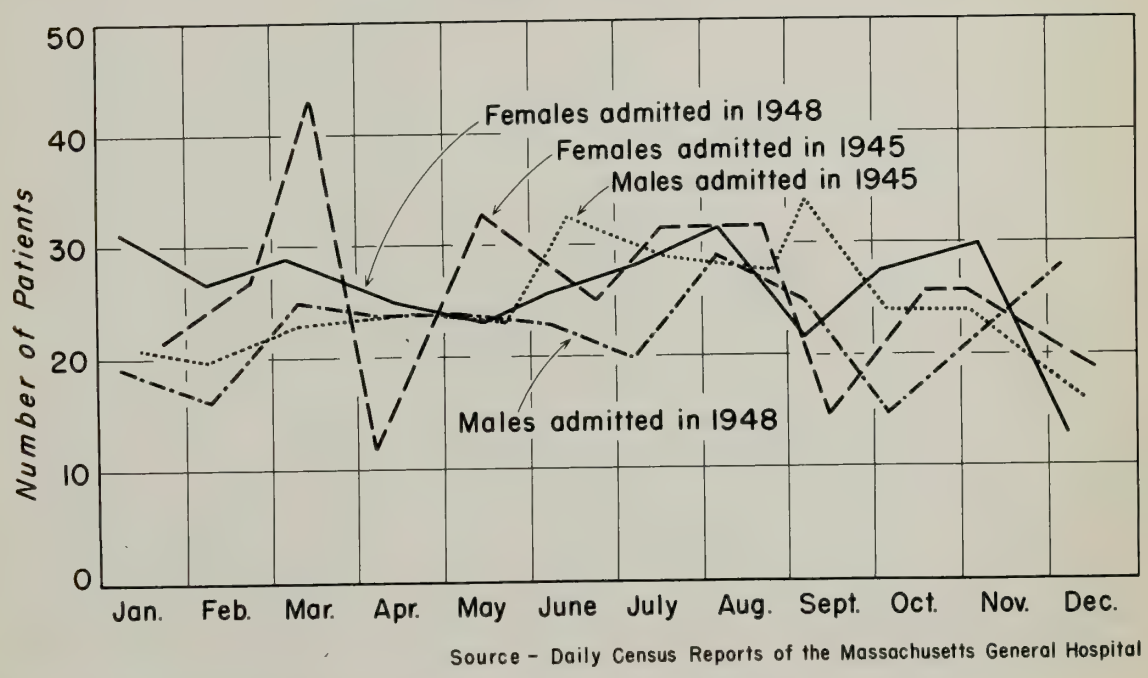

PATIENTS (MALE AND FEMALE) ADMITTED MONTHLY
ORTHOPAEDIC UNIT, MASSACHUSETTS GENERAL HOSPITAL
1945-1948
Number of Patients
50
40
30
20
10
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Females admitted in 1948
Females admitted in 1945
Males admitted in 1945
Males admitted in 1948
Source - Daily Census Reports of the Massachusetts General Hospital

Figure II

f. Age Grouping

A study of the ages of the patients admitted to the Orthopaedic Unit discloses that patients in all age groups were represented with the exception of infants. There were many more adults than children. It appears that 534 patients or 90.8 per cent of the patients admitted during the year 1948 were in the adult age groups and fifty-four patients or 9.2 per cent were in the child age groups (0-13 years). In comparing this with the age groupings of 1945 similar results were noted. (See TABLE 8 , page 40.)

Patients in the old age grouping (61-100 years) were in the majority during 1948. They represented 24.5 per cent of the total number of patients admitted. This bears out somewhat, the modern concept in the field of vital statistics that the population is living longer and the fact that modern science has made it more possible for older people to withstand the hospital medical and surgical procedures which are necessary to preserve their lives and restore them to health.

The number of patients in the other age groupings (adolescent, young adults, pre-middle age and middle age) were well represented during both years studied. (See TABLE 8 , page 40.)

The distribution of the number of patients admitted monthly to the Orthopaedic Unit showed nothing worthy of special

mention, except that there were more patients in the school age grouping (6-15 years) admitted during the months of June, July and August than in the other months of the year. (See TABLE 9, page 41.) This suggests that efforts are made on the part of the hospital to admit such patients when elective surgical or non surgical treatment is advised during the summer months in order not to interrupt the educational pursuits of the patient if possible. (SEE TABLE 9, page 41.)

TABLE 8.

COMPARISON OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT ACCORDING TO AGE GROUPINGS

YEARS 1945 and 1948

Age Groupings	Age in Years	Patients Admitted 1948 Number	1948 Per Cent	1945 Number	1945 Per Cent
Infant	less than 1	-	-	-	-
Pre School	1-5	8	1.4	16	2.61
School	6-13#	46	7.8	59	9.62
Adolescent	14-15	42	7.1	42	6.85
Young Adult	16-30	135	22.9	146	23.82
Pre-Middle Age	31-45	98	16.8	125	20.39
Middle Age	46-60	115	19.5	111	18.11
Old Age	61-100	144	24.5	114	18.60

Patients 0-13 years of age are considered children according to hospital census standards.

Source: Patient Records of the Massachusetts General Hospital.

TABLE 9.

DISTRIBUTION OF THE NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT ACCORDING TO AGE

YEAR 1948

Age in Years	Patients Admitted												
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
less than 1 yr	-	-	-	-	-	-	-	-	-	-	-	-	0
1-5	1	1	-	1	1	1	-	-	-	3	-	-	8
6-10	2	2	3	-	1	6	4	2	2	3	2	-	27
11-13#	2	2	0	1	3	1	4	3	2	0	1	0	19
14-15	2	0	3	4	6	4	3	6	7	4	2	1	42
16-20	8	6	2	5	3	7	8	8	5	3	4	4	63
21-25	4	4	2	4	4	6	3	3	2	6	1	4	45
26-30	4	3	4	3	3	1	3	1	2	-	1	2	27
31-35	1	1	3	4	4	3	3	3	2	3	2	1	30
36-40	5	1	3	2	-	4	2	2	5	4	7	2	37
41-45	1	2	5	1	3	1	2	4	3	2	3	4	31
46-50	3	6	7	3	1	3	3	3	3	1	4	6	43
51-55	3	6	7	2	3	1	1	3	5	3	3	6	43
56-60	2	1	3	4	2	3	1	5	2	1	3	2	29
61-65	1	1	4	1	23	3	2	2	-	3	3	3	27
66-70	5	5	2	3	4	1	1	4	4	2	4	1	36
71-75	2	1	4	4	1	1	2	4	1	2	1	1	24
76-80	1	2	1	3	4	1	4	5	3	2	7	2	35
81-85	2	-	1	2	2	-	1	-	-	1	3	1	13
86-90	1	-	-	2	-	2	-	1	-	-	1	1	8
91-95	-	-	-	-	-	-	1	-	-	-	-	-	1
96-100	-	-	-	-	-	-	-	-	-	-	-	-	0
Totals	50	44	54	49	47	49	48	61	48	43	54	41	588

#Patients 0-13 years of age are considered children according to hospital census standards.

Source: Records and Admission Data Concerning Patients Admitted to the Orthopaedic Unit at the Massachusetts General Hospital.

g. Patients Undergoing Surgical Operation

A review of the data concerning the surgical aspects of the clinical resources in the Orthopaedic Unit confirms a previously mentioned statement that the Orthopaedic Unit was considered to be one of the Surgical Specialties of the Hospital. In 1948, 494 operations were performed. Four hundred eighty-one (481) or 81.80 per cent of the patients admitted were operated upon. (See TABLE 10, page 44.) It must be remembered that the amount of operations performed do not indicate the number of "surgical" patients since it is not uncommon for one patient to have more than one operation. The following is an example of a patient who had more than one operation during one hospital stay:

Patient: M. C. Diagnosis: Rheumatoid Arthritis

Admitted: 1/12/48 Discharged: 6/28/48

Operation	Date
1. left cup arthroplasty	1/27/48
2. acromioplasty	1/29/48
3. right cup arthroplasty	2/19/48
4. Revision of left cup arthroplasty	5/20/48

In 1948 there were more patients operated upon and more operations performed than there were in 1945 (See TABLE 10, page 44.)

The amount of operations performed monthly during the years 1945, 1946, 1947 and 1948 were quite evenly distributed. (See TABLE 11, page 45.) The average number of surgical operations performed was forty operations per month. A survey of the amount of operations performed according to seasonal incidence during these same years demonstrates that more than 100 operations were performed during every quarter of each of the four years studied except in one instance. (See TABLE 12, page 46.)

TABLE 10.

COMPARISON OF NUMBER OF PATIENTS UNDERGOING

OPERATIONS AND AMOUNT OF OPERATIONS PERFORMED

YEARS 1945 AND 1948

Year	Total Admissions	Patients Undergoing operations		Operations Performed on Patients Admitted	
	Number	Number	Per Cent	Number	Per Cent
1948	588	481	81.80	494	82.00
1945	613	458	74.71	476	77.65

Source: Patient Records and Operating Room Records of the Massachusetts General Hospital

TABLE 11.

DISTRIBUTION OF AMOUNT OF SURGICAL OPERATIONS PERFORMED MONTHLY ON PATIENTS IN THE ORTHOPAEDIC UNIT

YEARS 1945 - 1948

Date	Surgical Operations Performed			
	1948	1945	1946	1947
January	47	43	43	51
February	41	37	46	31
March	40	40	35	42
April	46	35	38	49
May	43	43	37	43
June	46	40	37	54
July	43	37	47	54
August	38	38	35	42
September	31	46	45	32
October	42	33	33	40
November	30	36	30	35
December	37	30	30	48
Totals	494	476	463	501

Source: Patient Records and Operating Room Records of the Massachusetts General Hospital

TABLE 12.

DISTRIBUTION OF AMOUNT OF OPERATIONS PERFORMED ON PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT ACCORDING TO SEASONAL VARIATION

YEARS 1945 - 1948

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	128	135#	122	109
1945	120	118	121#	117
1946	124	112	134#	93
1947	124	146#	121	110

#Greatest amount of operations performed the year specified.

Source: Computed from TABLE 11, Page 45.

2. FINDINGS AND INTERPRETATION OF DATA CONCERNING PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT CLASSIFIED ACCORDING TO ADMITTING SERVICE

a Admissions

More patients were admitted yearly by the Orthopaedic Service than were admitted by the Fracture Service. In 1948 313 or 53.23 per cent of patients admitted were admitted by the Orthopaedic Service and 275 patients or 46.77 per cent were admitted by the Fracture Service. This is a little different from the usual pattern of previous years when the Fracture Service admitted about one-third of the patients to the Orthopaedic Unit. (See Table 13, page 49.) Distribution of the amount of monthly admissions show that in September and December of 1948 only there were more patients admitted by the Fracture Service than by the Orthopaedic Service. (See TABLE 14, page 50 and Figure III, page 41.) The number of patients admitted by the Orthopaedic Service in 1948 according to seasonal variation shows that the number of patients admitted seemed to be reasonably well distributed among the four quarters of the year. There were no marked changes when comparing this finding with those in the years 1946, 1947 and 1948. (See TABLE 15, page 52.)

The greatest number of admissions to the Orthopaedic Unit by way of the Fracture Service occurred during the third quarter of not only the year 1948 but also during the years 1945, 1946

and 1947. This is significant in view of the fact that it is so commonly believed that the greatest number of hospital admissions by way of a Fracture Service would take place during the winter or early spring months when slipping and falling on icy pavements would be a causative factor in the increased admission rates. More serious inquiry into this matter suggests that it is true that more accidents happen in the home than on the highway; that children unsupervised at play may fall heir to many traumatic incidents in the summer time; that many patients admitted by the Fracture Service were not "new" fracture cases - they may be returning for reconstructive surgery, change of cast, removal of mechanical devices used in the fixation of fractured bones, or to learn to walk again. (See TABLE 16, page 53, and Figure IV, page 54.)

b. Census

During 1948 the daily average patient census of those patients admitted by the Orthopaedic Service was 27.34 and those admitted by the Fracture Service was 14.72. Comparison of the daily average adult and child patient census shows that the daily average child census in both services falls away below the daily average adult census. (See TABLE 17, Page 55, and Figure V, page 54.)

TABLE 13.

DISTRIBUTION OF THE NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT ACCORDING TO ADMITTING SERVICE (ORTHOPAEDIC OR FRACTURE)

YEARS 1945 - 1948

Year	Both Services	Orthopaedic Service		Fracture Service	
		Number	Per Cent	Number	Per Cent
1948	588	313	53.23	275	46.77
1945	613	390	63.62	223	36.38
1946	617	427	69.21	190	30.79
1947	683	443	64.86	240	35.14

Source: Annual Reports of the Orthopaedic Department and Daily Census Reports of the Massachusetts General Hospital

TABLE 14.

DISTRIBUTION OF AMOUNT OF MONTHLY ADMISSIONS TO THE ORTHOPAEDIC UNIT ACCORDING TO ADMITTING SERVICE (ORTHOPAEDIC OR FRACTURE)

YEARS 1945-1948

Date	1945		1946		1947		1948	
	Service		Service		Service		Service	
	Ortho-paedic	Frac-ture	Ortho-paedic	Frac-ture	Ortho-paedic	Frac-ture	Ortho paedic	Frac-ture
January	27	16	45	11	53	26	30	20
February	28	19	29	20	42	10	26	18
March	44	22	23	14	49	21	29	25
April	27	9	27	10	39	21	27	22
May	38	18	31	15	34	18	24	23
June	34	25	27	22	37	21	27	22
July	33	28	51	22	33	27	28	20
August	37	23	43	10	53	18	31	30
September	32	17	44	20	31	23	22	26
October	35	15	35	15	19	21	26	17
November	34	16	37	17	23	14	30	24
December	21	15	35	14	30	20	13	28
Totals	390	223	427	190	443	240	313	275

Source: Annual Reports, Monthly Orthopaedic Department Reports, Daily Census Reports of the Massachusetts General Hospital

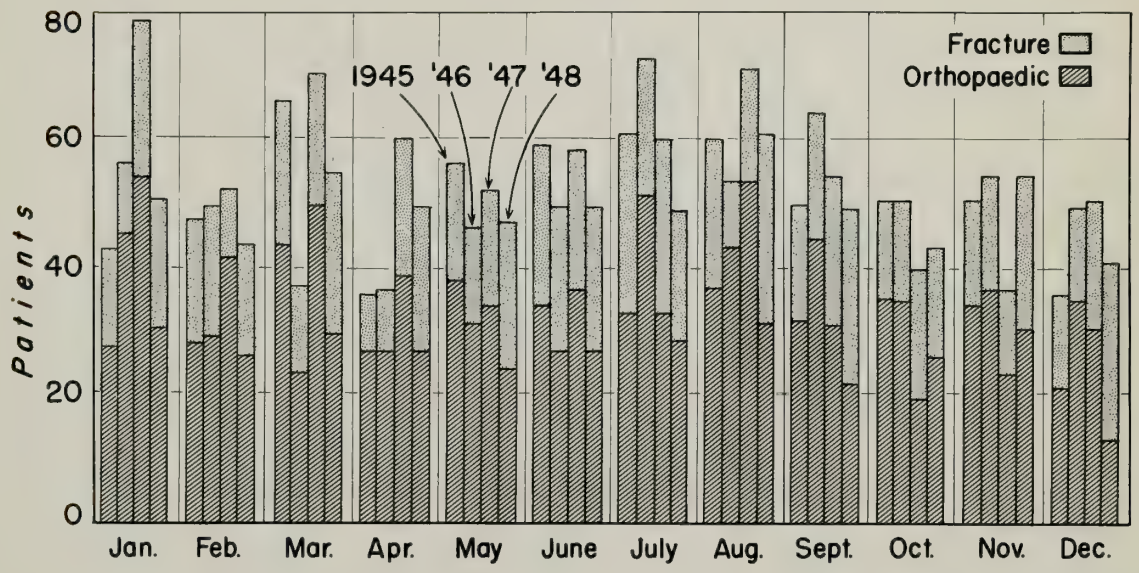


Figure III

TABLE 15.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED BY THE ORTHOPAEDIC SERVICE TO THE ORTHOPAEDIC UNIT ACCORDING TO SEASONAL VARIATION

1945 - 1948

Year	Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	85	78	81#	69
1945	99	99	102#	90
1946	77	85	138#	107
1947	144#	110	117	72

Greatest number of patients admitted to the Orthopaedic Service during the year specified.

Source: Computed from figures in TABLE 14, page 50.

TABLE 16.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT ACCORDING TO SEASONAL VARIATION BY THE FRACTURE SERVICE

1945 - 1948

Year	Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	63	67	76 #	69
1945	57	52	68 #	46
1946	45	47	52 #	46
1947	57	60	68 #	55

Greatest number of patients admitted to the Fracture Service during the year specified.

Source: Computed from figures in TABLE 14, Page 50 .

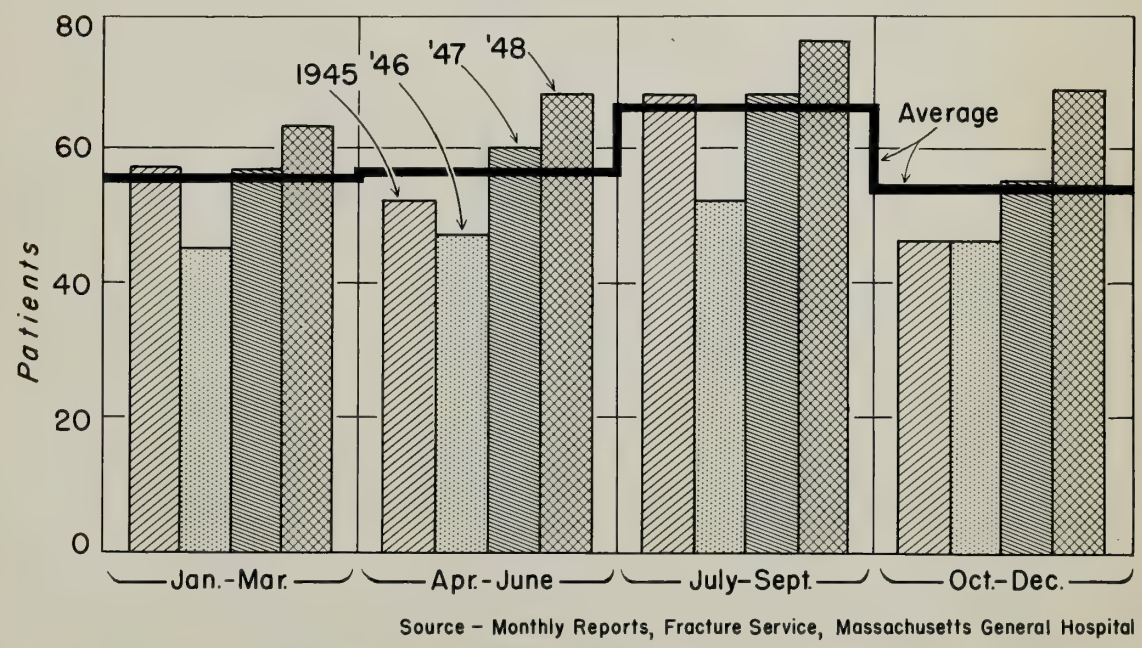

SEASONAL VARIATION IN NUMBER OF ADMISSIONS
THE FRACTURE SERVICE, ORTHOPAEDIC UNIT
1945-1948
80
60
40
20
0
Patients
1945
'46
'47
'48
Average
Jan.-Mar.
Apr.-June
July-Sept.
Oct.-Dec.
Source - Monthly Reports, Fracture Service, Massachusetts General Hospital

Figure IV

TABLE 17.

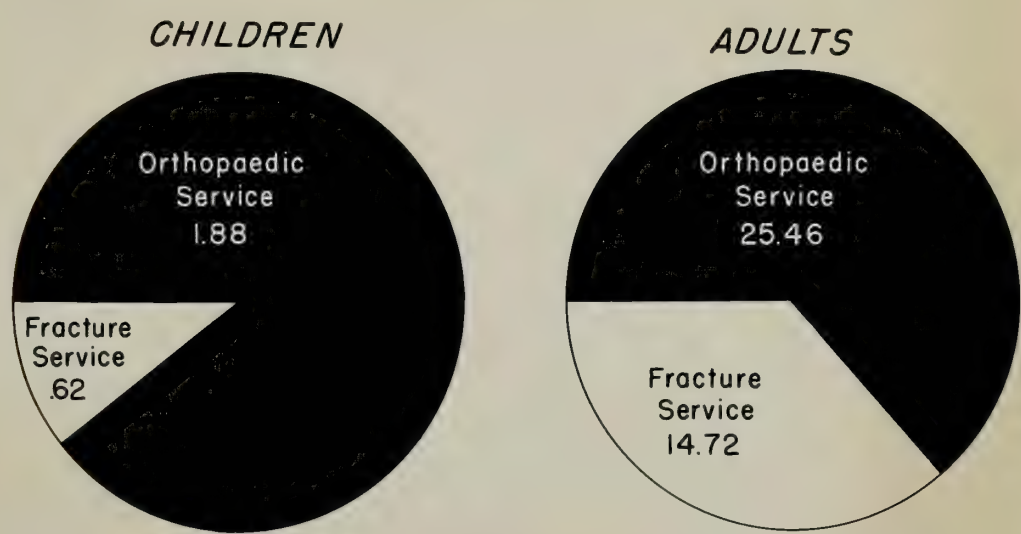
COMPARISON OF DAILY AVERAGE PATIENT CENSUS (CHILD AND ADULT) OF THE ORTHOPAEDIC UNIT ACCORDING TO ADMITTING SERVICE

YEAR 1948

	Daily Average Patient Census			
	Orthopaedic Service		Fracture Service	
Patients	Number	Per Cent	Number	Per Cent
Adults	25.46	93.12	14.72	96.09
Children	1.88	6.88	.62	3.91

Source: Tabulated From Daily Census Reports of the Massachusetts General Hospital

DAILY AVERAGE CENSUS OF PATIENTS
(CHILDREN AND ADULTS)
ORTHOPAEDIC UNIT, MASSACHUSETTS GENERAL HOSPITAL
1948



Source – Daily Census Reports, Massachusetts General Hospital

Figure V

c. Sex Incidence

It was found that more women were admitted by way of each of the services during the year 1948. (See TABLE 18, Page 58.) This was more true of the Fracture Service especially in which it was noticed that twenty-five more women than men were admitted. This can be accounted for by the fact that many of these women were those who were in the older age groups (61-75 years and 76 to 90) and were admitted with the diagnosis of a fractured femur. It has been proven by International Insurance Company Statistics and by those interested in the field of Geriatrics that in this day and age women live longer than men and therefore "live longer to break their bones."

TABLE 18.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT BY THE ORTHOPAEDIC AND FRACTURE SERVICE ACCORDING TO SEX

YEAR - 1948

Date	Patients Admitted			
	Service			
	Orthopaedic		Fracture	
	Male	Female	Male	Female
January	12	18	7	13
February	12	18	5	9
March	14	17	11	12
April	16	17	8	8
May	19	13	5	10
June	13	18	10	8
July	13	17	7	11
August	18	21	11	11
September	18	14	7	9
October	8	20	7	8
November	19	12	5	18
December	15	9	13	4
Totals	177	194	96	121

Source: Patient Records of the Massachusetts General Hospital

d. Number of Surgical Operations Performed

More surgical operations were performed during the past four years by the Orthopaedic Service than by the Fracture Service. This can be easily understood since the amount of admissions by the Orthopaedic Service are greater than those by the Fracture Service. Distribution of the amount of surgical operations performed monthly by the Admitting Services during the year 1948 shows clearly that, while in every instance the Orthopaedic Service performs more operations than the Fracture Service, both services did an average of 41.16 operations per month, 69.03 per cent of which were performed by the Orthopaedic Service and 39.97 per cent were performed by the Fracture Service. Examination of yearly and monthly totals during the years 1945, 1946 and 1947 show essentially the same results. (See TABLE 19, page 60.)

TABLE 19.

DISTRIBUTION OF AMOUNT OF SURGICAL OPERATIONS PERFORMED MONTHLY ON PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT ACCORDING TO ADMITTING SERVICE (ORTHOPAEDIC OR FRACTURE)

YEARS 1945 - 1948

Date	1948		1945		1946		1947	
	Service		Service		Service		Service	
	O#	F#	O	F	O	F	O	F
January	27	20	27	16	28	15	33	18
February	30	11	20	17	24	22	25	6
March	22	18	29	11	18	17	34	8
April	34	12	29	6	28	10	34	15
May	32	11	27	16	19	18	31	12
June	36	10	20	20	28	9	23	31
July	33	10	17	20	33	14	33	10
August	34	14	21	17	34	8	24	11
September	24	7	33	13	30	15	19	13
October	26	16	20	13	24	9	25	15
November	16	14	24	12	18	12	19	16
December	27	10	26	22	19	11	23	12
Totals	341	153	293	183	302	161	323	178

#O Orthopaedic Service

#F Fracture Service

Source: Patient Records and Operating Room Records of the Massachusetts General Hospital

e. Amount and Types of Operations Performed on Patients Admitted To The Orthopeadic Unit by These Admitting Services.

Orthopaedic Service

In reviewing the types of operations performed in 1945 and 1948 (See TABLE 20, page 64.) it was found that the "Repair" type of operation was in the majority during both the years 1948 and 1945 which is supporting evidence that attempts are being made to reconstruct the body of the orthopaedic patient to the end that he will enjoy more purposeful living. There were very few amputations performed. The same is true of suturing soft tissues, including tendons and ligaments. There was a marked decrease in the number of incisions performed in 1948. The decrease in the number of patients admitted with osteomyelitis (See TABLE 30, page 90.) for incision and drainage of their wounds may in some measure by responsible.

Fracture Service

The amount and type of surgical operations employed in the treatment of patients admitted by the Fracture Service (See TABLE 21, page 65) is indicative of a wide variety of types of operative management both traditional and modern. The amount of surgical intervention in the treatment of fractures by open reductions, internal fixation by nailing, wiring and bone grafting, are certainly in the majority. In comparing the types of operations performed during the two years studied

(See TABLE 21, page 65) it became apparent that more bone grafts were used in the internal fixation treatment of fractures. This may become even more popular now since the establishment of the Bone Bank at the Boston City Hospital which has become a very cooperative donor to surrounding hospitals. In 1948 two intra medullary fixations were done for the first time. This is a progressive step in making use of one of the most modern scientific techniques in the field of Orthopaedic Surgery. The large amount of internal fixations by nailing performed in both 1945 and 1948 reflects, to a great extent, the genius and interest in this type of fixation by Dr. Smith-Peterson, the former Chief of the Orthopaedic Department and probably more important, the inventor of the Smith-Peterson Nail and leading exponent of its world-wide use in the treatment of a fractured femur. The amount of operations performed for the purpose of inserting metal to effect skeletal traction is not entirely correct since many of these procedures (such as insertion of a Kirschner wire or a Steinman pin) arecarried out on the wards it is difficult to obtain a true record of this type of fracture treatment. It was also noted that there were very few vein ligations done in 1948 when compared with those done in 1945. During the latter year it was then the modern concept that all patients who were to be operated on for a fractured femur should have a prophylactic vein ligation to prevent the occurrence of a fatal

embolus. Hence it became almost routine. Now, in 1948, this procedure is carried out on selected patients when circumstances warrant it.

TABLE 20.

AMOUNT AND TYPES OF OPERATIONS PERFORMED ON PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT BY THE ORTHOPAEDIC SERVICE

YEARS 1945 and 1948

Year	Type of Operation#						
	Incision	Excision	Amputation	Repair	Destruction	Suture	Manipulation
1948	18	102	5	200	2	5	9
1945	56	85	7	123	0	10	19

According to the American Medical Association Standard Nomenclature of Disease and Operations Philadelphia: The Blakiston Company, 1947 pp. XV and 1022.

Source: Patient Records and Operation Room Records of the Massachusetts General Hospital

TABLE 21.

AMOUNT AND TYPE OF OPERATIONS PERFORMED MONTHLY ON PATIENTS ADMITTED BY THE FRACTURE SERVICE TO THE ORTHOPAEDIC UNIT

YEARS 1945 and 1948

Year	Manipulation		Reduction				Internal Fixation by						Traction				Removal		Miscellaneous including Vein Ligation	
			Closed		Open		Nails		Wire Band Screw		Inter Medullary Rod		Bone Grafting		Skeletal		of Bone Plate			
	48	45	48	45	48	45	48	45	48	45	48	45	48	45	48	45	48	45	48	45
Jan.	2			4	4	2	6	4	2	2			1	1	2				3	3
Feb.	1		1	1	2	7	2	5	2				2				1			4
Mar.	1	1	1	1	1	5	5		4	1			3				2		2	3
Apr.				1	2	2	5	1	2		1		1				1			2
May		1	1		2	2	4	4	1	2					1	2	2	1		4
June	1		1	1	4	9	1	6		2			2				1	1		1
July		1	4	3	1	4	3	6	1	1						1	1	1		3
Aug.	1		2		2	6	4	4	2	1							3	2		4
Sept.		1	1	1	2	9	2	1					1		1					1
Oct.			3	1	4	4	3	5		2			5		1					1
Nov.				3	4		7	3		1			1	1	1		2	1		3
Dec.		3	1	1	1	7	4	2		1	1		1	1	1	1	1	2		4
Totals	6	7	14	17	29	57	46	41	14	13	2	0	17	3	6	4	14	8	5	33

Source: Operating Room Records of the Massachusetts General Hospital

3 Findings and Interpretation of Data Concerning Patients Admitted to the Orthopaedic Unit With Orthopaedic Conditions Classified According to Cause.

Method of Classification

The patients who were admitted during the years 1945 and 1948 were classified according to the cause of their condition following quite closely the pattern set up in "The Standard Nomenclature of Diseases and Operations."[1]

The Classifications were titled as follows:

1. Classification I - Orthopaedic Conditions Due to Prenatal Influences
2. Classification II - Orthopaedic Conditions Due to Infections
3. Classification III - Orthopaedic Conditions Due to Trauma or Physical Agents
4. Classification IV - Orthopaedic Conditions Due to Disorders of Metabolism, Growth, or Nutrition
5. Classification V - Orthopaedic Conditions Due to New Growths
6. Classification VI - Orthopaedic Conditions Due to All Other Causes, Including Unknown or Uncertain Causes

1 American Medical Association, "The Standard Nomenclature of Diseases and Operations." Philadelphia: The Blakiston Company, 1947. Pp. xv and 1022.

These six overall classifications were broken down to show the more common types of orthopaedic conditions which might be found within the specific classification according to cause. They are as follows:

CLASSIFICATION I

ORTHOPAEDIC CONDITIONS DUE TO PRENATAL INFLUENCE

1. Cerebral Spastic Paralysis
2. Congenital Deformities of the Hands and Feet
   - Absence of a part
   - Accessory parts
   - Bony overgrowth
   - Club and claw feet and hands
   - Extra digits
   - Polydactylism
   - Syndactylism
   - Miscellaneous
3. Congenital Dislocation of the Hip
4. Obstetrical Paralysis
5. Spina Bifida
6. Torticollis
7. Miscellaneous

CLASSIFICATION II

ORTHOPAEDIC CONDITIONS DUE TO INFECTIONS

1. Arthritis (specific infectious)
2. Bursitis (infectious)
3. Infections of the Soft Tissues (synovitis, tenositis, tenosynovitis.)
4. Osteomyelitis
5. Residual Paralysis of Anterior Poliomyelitis
6. Tuberculosis (skeletal)

CLASSIFICATION III

ORTHOPAEDIC CONDITIONS DUE TO TRAUMA OR PHYSICAL AGENTS

1. Amputations
2. Backstrains
3. Bursitis
4. Contractures (Volkmann's ischemic contractures and others)
5. Dislocations
6. Fractures
7. Injury to Soft Tissues (sprains, strains, lacerations and tears of ligaments, tendons)
8. Internal Derangements of the Knee
9. Ruptured Intervertebral Disc
10. Miscellaneous

CLASSIFICATION IV.

ORTHOPAEDIC CONDITIONS DUE TO DISORDERS OF METABOLISM, GROWTH, OR NUTRITION

1. Chondrodysplasia
2. Deformities following rickets and scurvy
3. Epiphyseal Disturbance
4. Osteitis Deformans
5. Osteitis Fibrosa Cystica
6. Osteogenesis Imperfecta
7. Osteoporosis

CLASSIFICATION V.

ORTHOPAEDIC CONDITIONS DUE TO NEW GROWTHS

1. Cysts (bone)
2. Tumors
   - Liposarcoma
   - Osteochondroma
   - Osteogenic Sarcoma
   - Osteogenic Fibroma
   - Osteoid Osteoma
3. Metastatic Tumors
4. Miscellaneous including ganglia and neuroma

CLASSIFICATION VI

ORTHOPAEDIC CONDITIONS DUE TO ALL OTHER CAUSES,- INCLUDING UNKNOWN AND UNCERTAIN CAUSES

1. Arthritis
   - Rheumatoid
   - Degenerative Joint Disease
2. Hallux valgus
3. Hallux rigidus
4. Hammer toe
5. Myositis Ossificans
6. Neurological Disorders
7. Osteochondritis Dessicans
8. Pes Cavus
9. Pes Planus
10. Scoliosis
11. Slipped Femoral Epiphysis
12. Miscellaneous Conditions

(1) Admissions (See TABLE 22, page 72, and Figure VI, page 73.)

Comparison of the number of patients admitted in 1948 to the Orthopaedic Unit classified according to cause with those admitted in 1945 also classified according to cause reveals that one quite closely parallels the other. The number of patients admitted with Orthopaedic Conditions under Classification #III Due To Trauma or Physical Agents by far outweighed the others. These patients made up more than fifty per cent of the total number of patients admitted in each year. Patients admitted in 1948 with Orthopaedic Conditions Due To All Other Causes including Unknown and Uncertain Causes (Classification #VI) ranked second in order of the total number of patients admitted. Next was Classification #II - Orthopaedic Conditions Due To Infections. Then followed Classification #I - Orthopaedic Conditions Due To Prenatal Influence, Classification #IV - Orthopaedic Conditions Due to New Growths and lastly Classification #IV - Orthopaedic Conditions Due to Disorders of Metabolism Growth or Nutrition. This same sequence was recognized when reviewing the number of patients admitted in 1945 classified according to cause except that there were twenty-five less patients admitted during that year with Orthopaedic Conditions Due to Infection - Classification #II. Once again it comes to the writer's attention that the lower admission rate of patients with osteomyelitis may influence this. (See TABLE 31, page 91.)

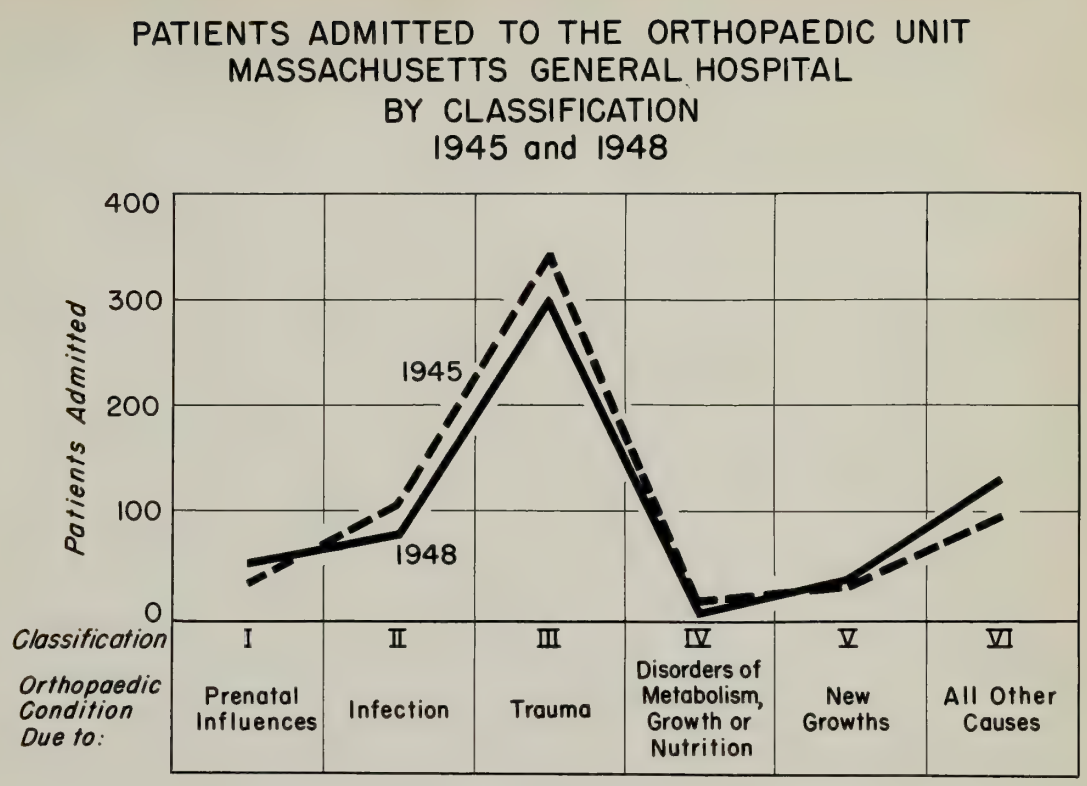
TABLE 22.

COMPARISON OF TOTAL AND AVERAGE PATIENT DAYS STAY OF ADMISSIONS TO THE ORTHOPAEDIC UNIT CLASSIFIED ACCORDING TO CAUSE OF CONDITION

YEARS 1945 and 1948

Classification Number	Orthopaedic Conditions Due to	Patients Admitted	Total Days Stay	Average Days Stay	No. of patients admitted	Total Days Stay	Average Days Stay
I	Prenatal Influence	53	1422	26.83	33	940	28.48
II	Infection	80	2368	29.6	105	2728	26.65
III	Trauma or Physical Agents	300	6255	20.85	339	7669	22.62
IV	Disorders of Metabolism, Growth, or Nutrition	4	45	11.25	11	307	27.9
V	New Growths	35	559	15.97	29	518	17.86
VI	All Other Causes Including Unknown and Uncertain Causes	116	3634	31.32	96	3333	34.71

Sources: Tabulated From Ward Daily Census Reports of the Orthopaedic Department and Patient Records of the Massachusetts General Hospital



Source — Patient Records of the Massachusetts General Hospital

Figure VI

(2) Patient Days Stay (See TABLE 23, page75, and Figure VII, page 76.)

The results of the tabulation of data concerned with the total and average patient days stay proved that in the both years studied, 1945 and 1948, that those patients admitted with orthopaedic conditions due to pre-natal influences, infection, trauma or physical agents had an average days stay of twenty to thirty days (3 to 4 weeks); that patients admitted with orthopaedic conditions due to all other causes, including unknown and uncertain causes - Classification #VI (See list of conditions included on page 70) had an average days stay of thirty-one to thirty-five days (at least one month).

Patients admitted with orthopaedic conditions due to disorders of metabolism, growth, or nutrition or due to new growths had an average days stay of 11-16 days stay in 1948 and an average days stay of 18 to 28 days stay in 1945. These figures were not as significant as the previous ones since patients admitted with orthopaedic conditions due to these last mentioned causes were in the minority.

TABLE 23.

COMPARISON OF TOTAL AND AVERAGE PATIENT DAYS STAY OF ADMISSIONS TO THE ORTHOPAEDIC UNIT CLASSIFIED ACCORDING TO CAUSE OF CONDITION

YEARS 1945 and 1948

Classification Number	Orthopaedic Conditions Due to	Patients Admitted	Total Days Stay	Average Days Stay	No. of patients admitted	Total Days Stay	Average Days Stay
I	Prenatal Influence	53	1422	26.83	33	940	28.48
II	Infection	80	2368	29.6	105	2728	26.65
III	Trauma or Physical Agents	300	6255	20.85	339	7669	22.62
IV	Disorders of Metabolism, Growth, or Nutrition	4	45	11.25	11	307	27.9
V	New Growths	35	559	15.97	29	518	17.86
VI	All Other Causes Including Unknown and Uncertain Causes	116	3634	31.32	96	3333	34.71

Sources: Tabulated From Ward Daily Census Reports of the Orthopaedic Department and Patient Records of the Massachusetts General Hospital

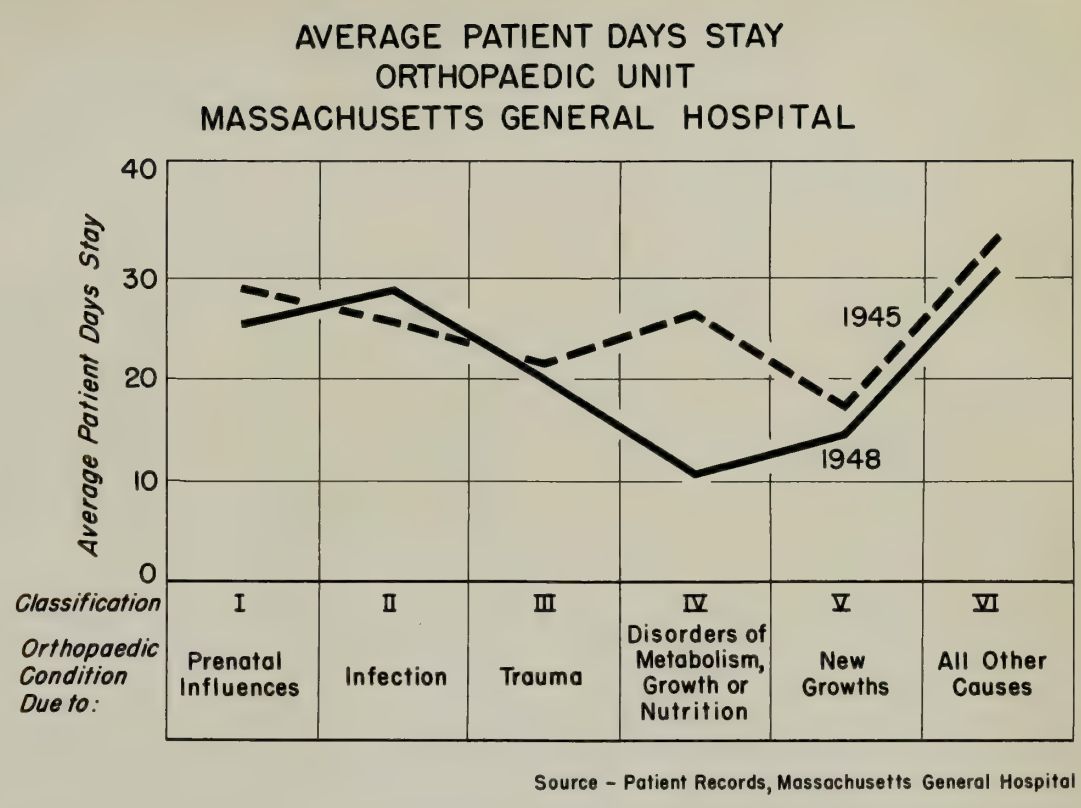

AVERAGE PATIENT DAYS STAY
ORTHOPAEDIC UNIT
MASSACHUSETTS GENERAL HOSPITAL
Average Patient Days Stay
40
30
20
10
0
1945
1948
Classification
I
II
III
IV
V
VI
Orthopaedic Condition Due to:
Prenatal Influences
Infection
Trauma
Disorders of Metabolism, Growth or Nutrition
New Growths
All Other Causes
Source - Patient Records, Massachusetts General Hospital

Figure VII

3A Findings and Interpreation of Data Concerning Patients Admitted to the Orthopaedic Unit, With Conditions Due To Prenatal Influences

1 Amount

a. Admissions (See TABLE 24 , page 80.)

A total of fifty-three patients with orthopaedic conditions due to prenatal influences (Classification #I) were admitted in 1948. This represents an increase of twenty patients over the number of patients admitted with the same general type of orthopaedic condition in 1945.

A monthly distribution of the number of these patients admitted shows representation during each month of the years 1945 and 1948 (See TABLE 25, page 81.) The distribution of the number of these patients admitted according to seasonal variation shows no remarkable distinction among the quarterly divisions of the years 1945 and 1948. (See TABLE 26 , page 82.)

b. Type (See TABLE 24 , page 80.)

Patients with some of the more common types of orthopaedic conditions due to prenatal influence were not present on the yearly admission list or were present in small numbers during both years, 1945 and 1948.

Conspicuous because of their low admission figures were those patients admitted with orthopaedic conditions associated with the following diagnoses: four patients with cerebral

spastic paralysis (cerebral palsy); four patients with club foot, three patients with spina bifida and only one patient with obstetrical paralysis (Erb's Palsy). In the majority were those patients admitted with congenital dislocation of the hip. There were eighteen of them. A possible answer to this majority is that fifty per cent or nine of these eighteen patients were admitted to the Orthopaedic Unit for the purpose of having a Smith-Peterson cup arthroplasty, or a revision of a cup arthroplasty operation. This modern surgical maneuver has been used successfully during the past few years for the treatment of adult patients who have had congenital dislocation of the hip or hips. Once again, the writer invites attention to the manner in which certain types of clinical resources reflect the interest and skill of the former Chief of the Orthopaedic Department - Dr. Smith-Peterson and his students to whom patients come from all over the country and, in fact the world, to have this operation performed.

c. Age Grouping (See TABLE 27, page 83.)

When one thinks of orthopaedic conditions due to prenatal influences, immediately the thought of crippled children comes to mind. A study of the ages of the patients admitted with these conditions during 1948 revealed that only eighteen or one third of these patients were in the child age grouping of 0-13 years. Another one third of these

patients were in the age grouping of 14-20 years and the remaining one third were in the age range between twenty-one and fifty years. Similar results were found in a study of age groupings of the same type of patients admitted during the year 1945. It might be well to point out that of the eighteen patients who were found to be in the age grouping of 0-13 years that eight or forty-four per cent of them were patients with congenital dislocations of the hip and that none of the patients admitted with cerebral palsy, club foot, obstetrical paralysis, or spina bifida were recorded in this child age grouping.

d. Surgical Operations Performed (See TABLE 28 , Page 84 and page 85.)

The fifty-three patients admitted in 1948 with conditions due to prenatal influences had a total of forty-seven operations. The operations were primarily of the reconstruction type which attempt not only to correct the congenital deformity but also to correct any acquired deformities which occurred as the result of the congenital deformity. (See TABLE 28, page 84 and 85.) It was also noted that some of the most modern surgical procedures are being used in the operative management of patients with congenital dislocation of the hip such as epiphyseal arrest and cuparthroplasty. (See TABLE 28, page 85.)

TABLE 24.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO PRENATAL INFLUENCES

YEARS 1945 and 1948

Condition	Number of Patients Admitted	
	Year 1948	Year 1945
1. Cerebral Spastic Paralysis	4	2
2. Congenital Deformities of Hands and Feet		
Absence of a part	2	-
Accessory scaphoids	1	2
Boney overgrowth	-	-
Claw foot	3	1
Club hand	4	-
Club foot	3	6
Extra digits	-	-
Polydactylism	-	-
Syndactylism	-	-
Miscellaneous		
Cock-up toe	-	5
Overlapping toe	1	-
Pes planus	2	-
Pigeon toes	1	-
Rigid toe	-	1
3. Congenital Dislocation		
Elbow	1	-
Hip	18	6
4. Obstetrical Paralysis	1	2
5. Spina Bifida	3	2
6. Torticollis	7	3
7. Miscellaneous		
Congenital malformation of a rib	-	1
Extra Cervical rib	1	1
Genu valgum	1	1
Klippel-Feil's Syndrome	0	1
Totals	53	33

Source: Patient records and Daily Ward Census Records at the Massachusetts General Hospital

TABLE 25.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO PRENATAL INFLUENCE

YEARS 1945 and 1948

Year	Number of Patients Admitted	
	Year 1945	Year 1948
January	6	1
February	8	2
March	4	1
April	2	2
May	2	3
June	5	2
July	3	2
August	6	5
September	5	5
October	5	4
November	2	4
December	5	2
Totals	53	33

Source: Patient records and Daily Census Reports at the Massachusetts General Hospital

TABLE 26.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO PRENATAL INFLUENCE ACCORDING TO SEASONAL VARIATION

YEARS 1945 and 1948

Year	Number of Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	18#	9	14	12
1945	4	7	12#	10

#Greatest number of patients admitted during the year specified

Source: Computed from TABLE 25 , Page 81.

TABLE 27.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO PRENATAL INFLUENCE ACCORDING TO AGE GROUPING

YEARS 1945 and 1948

Age in Years	Patients Admitted	
	Year 1948	Year 1945
0 - 1	-	-
1 - 13#	18	13
14 - 20	19	16
21 - 30	7	3
31 - 40	4	1
41 - 50	5	-
51 - 60	-	-
61 - 70	-	-
71 - 80	-	-
81 - 90	-	-
91 - 100	-	-

Patients 0 - 13 years of age are considered children according to hospital census standards

Source: Patient records at the Massachusetts General Hospital

TABLE 28.

TYPES OF OPERATIONS

PERFORMED ON PATIENTS ADMITTED TO THE ORTHOPAEDIC

UNIT DUE TO PRENATAL INFLUENCE

YEAR - 1948

Condition		Number of Operations	Number of Patients With Conditions
Cerebral Spastic Paralysis	1. Correction of flexion contractures	2	
	2. Arthrodesis of ankle	1	
		3	4
Congenital Absence of a Part	1. Bone grafting	1	
	2. Muscle transplanting	1	
		2	2
Club Hand	1. Osteotomy of fingers	2	
	2. Release of contractures	1	
	3. Wrist fusion	1	
		4	4
Congenital Deformity of Feet			
Accessory Scaphoids	1. Excision of accessory scaphoids	1	
		1	1
Claw foot, Hammer toe, Overlapping toe, Pes planus, Pigeon toes	1. Lengthening extension tendon	2	
	2. Reconstruction of pes planus	1	
	3. Excision of proximal phalanx of toe	2	
	4. Extensor fasciotomy	1	
		6	7

Condition	Operations	Number of Operations	Number of Patients with Conditions
Congenital Dislocation of Hip	1. Manipulation	3	
	2. Epiphyseal arrest	1	
	3. Trochanter transplant	1	
	4. Tendon transplant	1	
	5. Cup arthroplasty	5	
	6. Revision of cup arthroplasty	5	
		16	18
Congenital Dislocation of Elbow	1. Plastic maneuver to elbow joint	1	
		1	1
Obstetrical Paralysis	1. Tendon transplant and release of muscle contractures	1	
		1	1
Spina Bifida	1. Correction of flexion deformities	2	
	2. Skin graft to leg ulcers	1	
		3	3
Torticollis	1. Myotomy	7	
		7	7

3B Findings and Interpretation of Data Concerning Patients Admitted to the Orthopaedic Unit With Conditions Due to Infections

Amount

(1) Admissions (See TABLE 29 , page 89.)

A total of eighty patients was admitted with conditions due to infections (Classification #II) in 1948. This number represents twenty-five patients less than were admitted with the same type of conditions in 1945. Accountable for this decrease is the notable fall in the number of patients admitted in 1948 with osteomyelitis. (See TABLE 31, page 91, Figure VIII, page 92.) Only forty-six patients with osteomyelitis were admitted in 1948 and seventy-three patients with osteomyelitis were admitted in 1945. That is to say that twenty-seven less patients were admitted in 1948. There is little doubt that the use of penicillin in the successful treatment of both acute and recurrent osteomyelitis has played a major part in cutting down the admission totals. The distribution of patients admitted monthly to the Orthopaedic Unit with conditions due to infections shows during each month an average of 6.66 patients of this type was admitted. (See TABLE 33 , page 44 .)

The distribution of these same patients admitted according to seasonal variation shows that most admissions tended to occur during the third quarter of both years 1945 and 1948. (See TABLE 34 , page 95.)

b. Type

Only two patients with orthopaedic conditions due to specific infections arthritis and infections of soft tissues were admitted.

There was a great increase in the number of patients admitted with residual anterior poliomyelitis, (See TABLE 29, page 89.) In fact there were seventy-three per cent more of these patients admitted in 1948 than there were in 1945. Several reasons for this may be suggested among which are: (1) the interest of the present Chief of the Orthopaedic Department in this particular phase of Orthopaedic Surgery; (2) the increased support to the Massachusetts General Hospital by the National Foundation for Infantile Paralysis for the care of patients with anterior poliomyelitis; (3) the increased and stabilized medical staff prepared to do more elective surgery since the end of hostilities; and (4) the hospital admission waiting list of those desiring elective Orthopaedic Surgery which had been "bursting at the seams" during the war years began to fall off to normal levels early in 1948. The number of patients admitted with skeletal tuberculosis ranged between ten and fifteen in the years 1945 and 1948.

c. Age Grouping (See TABLE 35, page 96.)

In surveying the age groupings of those patients admitted in 1948 with osteomyelitis, skeletal tuberculosis and

residual anterior poliomyelitis (three conditions which are seen commonly in crippled children) it was discovered that the only children who were admitted with these conditions were three with osteomyelitis, four with residual poliomyelitis and none with skeletal tuberculosis.

Of the twenty-two patients admitted with residual anterior poliomyelitis ten or almost fifty per cent were in the 21-30 year age group. It must be remembered that this is an "epidemic" disease and that very often the number of admissions and the patient age grouping reflects an epidemic year in a particular locality where people are stricken with this disease.

d Surgical Operations Performed (See TABLE 36 , page 97 .)

The eighty patients admitted had forty-seven operations of various types. The eighteen operations for osteomyelitis were mainly those of incision and drainage which may demand careful dressing technique and wound irrigation post-operatively. The twenty surgical operations performed on the twenty-two patients with residual anterior poliomyelitis were mainly the plastic type,-lengthening and transplanting muscles for the purpose of restoring useful function to the muscles and joints. This type of operation demands a long routine exercise program before the surgeon's objectives are achieved. Two spinal fusion operations were done for patients with skeletal tuberculosis (Pott's Disease - tuberculosis of the vertebra).

TABLE 29.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO INFECTIONS

YEARS 1945 and 1948

Condition	Number of Patients Admitted	
	Year 1948	Year 1945
1. Arthritis (specific infectious)	1	6
Old syphilytic joint	-	1
2. Bursitis (infectious)	-	2
3. Infections of soft tissues		
Tenosynovitis	1	2
4. Osteomyelitis	46	73
5. Residual Paralysis of Anterior Poliomyelitis	22	6
6. Tuberculosis (skeletal)	10	15
Totals	80	105

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 30.

COMPARISON OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH OSTEOMYELITIS (ACUTE AND RECURRENT)

YEARS 1945 and 1948

Year	Patients Admitted With			
	Acute Osteomyelitis		Recurrent Osteomyelitis	
	Number	Per Cent	Number	Per Cent
1948	16	34.78	30	65.22
1945	28	38.36	45	61.64

Source: Patient Records of the Massachusetts General Hospital

TABLE 31.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT WITH OSTEOMYELITIS

YEARS 1945 - 1948

Date	Number of Patients Admitted			
	1945	1946	1947	1948
January	#11	#8	4	2
February	3	1	1	4
March	8	3	4	5
April	7	2	9	3
May	5	1	1	#6
June	8	3	1	1
July	7	5	5	3
August	4	6	#12	4
September	9	3	4	5
October	4	2	2	4
November	4	5	3	6
December	3	1	2	3
Totals	73	40	48	46

#Greatest number of monthly admissions in the year specified

Source: Monthly Reports of the Orthopaedic Department and patient records of the Massachusetts General Hospital.

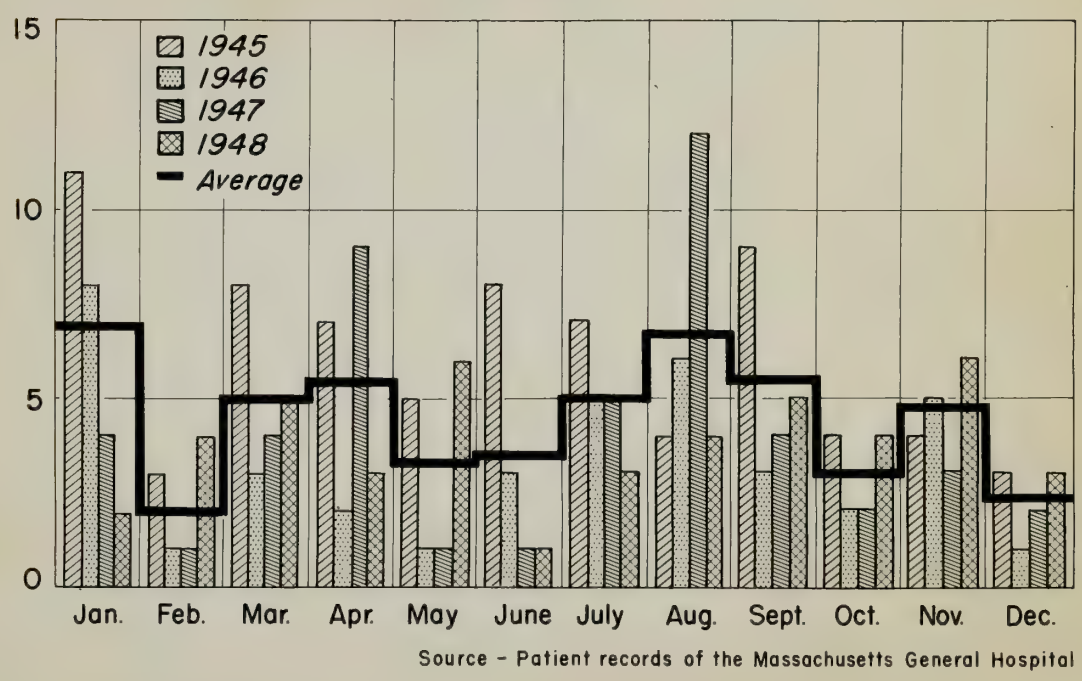


Figure VIII

* Unit

TABLE 32.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH OSTEOMYELITIS ACCORDING TO SEASONAL VARIATION

YEARS 1945 - 1948

Year	Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	11	10	12	13 #
1945	22 #	20	20	11
1946	12	6	14 #	8
1947	9	11	21 #	7

Greatest number of patients with osteomyelitis admitted during the year specified.

Source: Computed from figures on TABLE 31, page 91.

TABLE 33.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO INFECTIONS

YEARS 1945 and 1948

Date	Number of Patients Admitted	
	Year 1948	Year 1945
January	3	11
February	6	6
March	11	12
April	6	7
May	7	6
June	4	10
July	9	13
August	5	8
September	9	12
October	7	6
November	8	9
December	5	5
Totals	80	105

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 34.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO INFECTIONS ACCORDING TO SEASONAL VARIATION

YEARS 1945 and 1948

Year	Number of Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	20	17	23#	20
1945	29	23	33#	20

Greatest number of patients admitted during the year specified

Source: Computed from TABLE 33, page 94.

TABLE 35.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO INFECTIONS (OSTEOMYELITIS, BONE TUBERCULOSIS, AND RESIDUAL ANTERIOR POLIOMYELITIS) ACCORDING TO AGE GROUPING

YEAR 1948

	Patients Admitted with		
Ages in Years	Osteomyelitis	Skeletal Tuberculosis	Residual Anterior Poliomyelitis
0 - 1	-	-	-
1 - 13/	3	-	4
14 - 20	7	3	5
21 - 30	7	3	10
31 - 40	5	-	2
41 - 50	10	2	-
51 - 60	7	2	1
61 - 70	5	-	-
71 - 80	2	-	-
81 - 90	-	-	-
91 - 100	-	-	-

/Patients 0 13 years of age are considered children according to hospital census standards.

Source: Patient records at the Massachusetts General Hospital

TABLE 36.

TYPES OF OPERATIONS

PERFORMED ON PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT

WITH CONDITIONS DUE TO INFECTIONS

YEAR - 1948

Condition	Operations	Number of Operations	Number of Patients with Conditions
Osteomyelitis	1. Incision and drainage of abscess with or without insertion of canula for drainage	10	
	2. Saucerization	1	
	3. Sequestrectomy	7	
		18	46
Residual Paralysis from Anterior Poliomyelitis	1. Tenotomy of flexor tendon	3	
	2. Tendon transplanting	7	
	3. Lengthening tendon of Achilles	2	
	4. Tenodesis of gastrocnemius	1	
	5. Lumbar sympathectomy	1	
	6. Arthrodesis of ankle	6	
		20	22
Tuberculosis of bone	1. Excision of cold abscess	2	
	2. Triple arthrodesis	1	
	3. Spinal fusion	2	
	4. Aspiration of joint fluid	4	
		9	10

Source: Patient Records and Operating Room Records of the Massachusetts General Hospital

3 C. Findings and Interpretation of Data Concerning Patients Admitted to the Orthopaedic Unit with Conditions Due to Trauma or Physical Agents

Amount

Admissions (See TABLE 37, page 101.)

Exactly 300 patients were admitted with conditions due to trauma or physical agents in 1948. This represents a decrease of 39 patients when compared with the total admission of 1945.

Distribution of the number of patients admitted monthly with these conditions shows that in 1948 there was an average monthly admission count of twenty-five patients and that in all months there were more than seventeen patients and less than thirty-three patients admitted. (See TABLE 38, page 102.)

The distribution of the number of patients admitted according to seasonal variation is indicative of quite evenly balanced proportions of admissions during both 1945 and 1948. The fourth quarter of both years showed a drop in the number of admissions during that period. There were about as many or more admissions during the third quarter of both years. This confirms the ever present threat of trauma, implications for necessary prevention, the continuous hospital responsibility of opening its doors, summer and winter, for the treatment and rehabilitation of those whose bodies have been traumatized. (See TABLE 39, page 103.)

b Type (See TABLE 37, page 101.)

Among the 300 patients admitted were 238 patients (79.33 per cent) who had suffered a fracture. Of these 238 patients 172 or seventy-two per cent of them were admitted with a "new" fracture and the remaining twenty-eight per cent were admitted with "old" fractures - patients returning for reconstructive surgery, to learn to walk, or for the removal of internal fixation devices such as nails and screws used in the treatment of fractures. When the anatomical location of these 238 fractures were reviewed it was noted that the bones commonly involved in fractures were represented except in those fractures of the skull, nose, jaw, and ribs. Of all the locations represented the femur took precedence. They comprise more than fifty per cent of all the fractures recorded, fractures of the lower extremity (tibia and fibula) and fractures of the upper extremity (radius and ulna) are next in frequency. (See TABLE 40, page 104, and TABLE 41, page 105.)

Next to patients with fractures, patients with internal derangements of the knee rank second in number and patients with ruptured intervertebral discs were third. There were but seven patients who had injuries to the soft tissues and only five patients with amputations (lower extremity). There were no patients with amputations of the upper extremity.

c. Age Grouping (See TABLE 42, page 106, TABLE 43, page 107, and TABLE 44, page 108.)

All age groups were represented except infants. More than fifty patients were recorded in each age grouping except in the grouping 0 - 13 years in which there was twenty-three patients or 7.67 per cent of the total number of patients. Therefore 92.33 per cent of the patients were fourteen years of age or older. It is interesting to note that one patient was over ninety years of age.

d. Surgical Operations Performed (See TABLE 45, page 109 and 110.)

A total of fifty-five operations were performed on the sixty-two patients who were admitted to the Orthopaedic Unit with conditions due to trauma and physical agents exclusive of fractures. (See TABLE 21, page 65.) The greatest number of operations (13) were performed on patients with back strain, unstable spine and ruptured intervertebral disc. Nine (9) of these thirteen operations were spinal fusions. Internal derangements of the knee also called for thirteen operations of the repair type. Five (5) amputations were performed.

TABLE 37.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO TRAUMA OR PHYSICAL AGENTS

YEARS 1945-1948

Condition	Number of Patients Admitted Year 1948	Year 1945
1. Amputation	5	2
2. Backstrain	5	34
3. Bursitis	8	9
4. Contractures		
Miscellaneous	3	4
Volkmann's Ischemic	12	2
5. Dislocations		
Current	1	2
Recurrent	1	3
6. Fractures	238	223
7. Injuries to Soft Tissues		
Contusion	-	1
Ligament Tear	1	-
Tendon Laceration	3	1
Tendon Rupture	3	-
8. Internal Derangements of Knee	15	29
9. Ruptured Intervertebral Disc	14	20
10. Miscellaneous		
Spondylolisthesis	-	1
Traumatic Knee Fusion	-	1
TOTALS	300	339

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 38.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO TRAUMA OR PHYSICAL AGENTS

YEARS 1945 - 1948

Date	Number of Patients Admitted	
	Year 1948	Year 1945
January	29	23
February	21	27
March	30	36
April	26	19
May	22	32
June	26	34
July	23	39
August	31	30
September	23	25
October	17	28
November	32	27
December	20	19
Totals	300	339

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 39.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO TRAUMA AND PHYSICAL AGENTS ACCORDING TO SEASONAL VARIATION

YEARS 1945 and 1948

Year	Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	80#	74	77	69
1945	86	85	94#	74

#Greatest number of patients admitted during the year specified.

Source: Computed from TABLE 38, page 102.

TABLE 40.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH "NEW" AND "OLD" FRACTURES CLASSIFIED ACCORDING TO LOCATION OF FRACTURE

YEAR 1948

Anatomical Location of Fracture	Patients Admitted With Fractures		
	New Fracture	Old Fracture	Total
Clavicle	2	-	2
Elbow Joint	1	1	2
Femur	91	42	133
Fibula	1	-	1
Foot			
Ankle	6	2	8
Os Calcis	2	-	2
(Phalanges (Tarsals and (Metatarsal	2	3	5
Hand			
(Carpals and (Metacarpal (Phalanges	5	1	6
Humerus	7	1	8
Jaw	-	-	-
Nose	-	-	-
Patella	4	-	4
Pelvic Ring	5	-	5
Radius	11	4	15
Ribs	-	-	-
Scapula	-	-	-
Skull	-	-	-
Tibia	9	6	15
Tibia and Fibula	8	3	11
Ulna	-	2	2
Ulna and Radius	4	1	5
Vertebra	7	-	7
Cervical Vertebra	4	-	4
Miscellaneous			
Pathological Fractures	3	-	3
TOTALS	172	66	238

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 41.

DISTRIBUTION OF MONTHLY ADMISSIONS WITH FRACTURES TO THE ORTHOPAEDIC UNIT CLASSIFIED ACCORDING TO LOCATION OF FRACTURE

YEAR - 1948

Location of Fracture	Patients Admitted During Month of												
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Clavicle							1			1			2
Elbow Joint				1	1								2
Femur	13	10	14	12	13	8	10	13	6	9	16	9	133
Fibula		1											1
Foot													
Ankle		2	1		1		1	2	1				8
Os Calcis									1	1			2
Phalanges													
Tarsal and Metartusal	1					1		2		1			5
Hand													
Carpals and Metacarpel Phalanges						2		1	1		2		6
Humerus	1	1		1	1	1			1	1		1	8
Patella	2						1			1			4
Pelvic Ring	1		1					1			1	1	5
Radius		2	3	1		3	1	1	2	1	2		15
Tibia	1		2	3		3			1		1	4	15
Tibia and Fibula	2		2	1		1	1	1	1		1	1	11
Ulnar													
Ulnar and Radius						1	1			1	2		6
Vertebra	1		1	1		2			1			1	7
Cervical Vertebra							1	2	1				4
Miscellaneous													
Pathological Fractures							1	1	1				3
Totals	22	16	24	20	16	22	18	24	17	16	26	17	238

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 42.

DISTRIBUTION OF THE NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO TRAUMA AND PHYSICAL AGENTS ACCORDING TO AGE GROUPING

YEAR 1948

Age In Years	Number	Per Cent
0-1	-	-
1 - 13#	23	7.67
14 - 30	50	16.67
31 - 45	51	17.00
46 - 60	60	20.00
61 - 75	63	21
76 - 90	52	17.33
91 - 100	1	.33

#Patients 0 - 13 years of age are considered children according to hospital census standards.

Source: Patients Records of the Massachusetts General Hospital

TABLE 43.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH "OLD" FRACTURES ACCORDING TO AGE GROUPING

YEAR 1948

Age in Years	Patients Admitted With Old Fractures	
	Number	Per Cent
0 - 1	-	-
1 - 13#	3	4.55
14 - 30	16	24.24
31 - 45	10	15.15
46 - 60	10	15.15
61 - 75	14	21.21
76 - 90	13	19.70
91 - 100	-	-

#Patients 0 - 13 years of age are considered children according to hospital census standards

Source: Patient Records of the Massachusetts General Hospital

TABLE 44.

DISTRIBUTION OF TOTAL NUMBER OF PATIENTS ADMITTED WITH FRACTURES TO THE ORTHOPAEDIC UNIT ACCORDING TO AGE AND SEX

YEAR 1948

Age in Years	Number of Patients Admitted With Fractures		
	Male	Female	Total
0 - 1	-	-	-
1 - 13	12	6	18
14 - 30	23	8	31
31 - 45	22	12	34
46 - 60	15	26	41
61 - 75	17	44	61
76 - 90	16	36	52
91 - 100	-	1	1
Totals	105	133	238

Source: Patient Records of the Massachusetts General Hospital

TABLE 45.

TYPES OF OPERATIONS

PERFORMED ON PATIENTS ADMITTED TO THE ORTHOPAEDIC

UNIT WITH ORTHOPAEDIC CONDITIONS DUE TO TRAUMA

AND PHYSICAL AGENTS

YEAR 1948

Condition	Operation	Number of Operations	Number of Patients With Conditions
Amputation	1. Low thigh amputation	2	
	2. Mid thigh amputation	1	
	3. Above the knee amputation	1	
	4. Toe amputation	1	
	5. Skin graft to amputation stump	2	
	6. Revision of amputation stump	1	
		8	5
Back Strain, Unstable Spine and Ruptured Intervertebral Disc	1. Laminectomy	1	
	2. Laminectomy, spinal fusion and tibial graft	2	
	3. Laminectomy, spinal fusion and iliac graft	9	
	4. Exploration and excision of meningocele	1	
		13	19
Bursitis	1. Excision sub-deltoid bursa	3	
	2. Excision of olecranon bursa	2	
	3. Ankle fusion	1	
		6	8
Contractures	1. Release of muscle contractures	4	
		4	4
Internal Derangements of the Knee	1. Removal of medial meniscus (meniscectomy)	1	
	2. Repair of ruptured quadriceps tendon	4	
	3. Arthrotomy of knee	7	
	4. Fascia lata repair of knee	1	15
		13	

Condition	Operation	Number of Operations	Number of Patients With Conditions
Dislocations	1. Repair of acromio-clavicular separation	1	
	2. Repair of ruptured supraspinatus tendon	1	
	3. Reconstruction of recurrent dislocated shoulder (Niscla Procedure)	2	
		4	4
Miscellaneous			
Contusions, lacerations, and tendon ruptures	1. Repair 2. Debridement 3. Suture	7	
		7	7

Exclusive of operations performed on those patients with fractures. See Page 65.

Source: Patient records and Operating Room Records of the Massachusetts General Hospital

3. D. Findings and Interpretation of Data Concerning Patients Admitted to the Orthopaedic Unit Due to Disorders of Metabolism, Growth or Nutrition

a. Amount (See TABLE 46 , page 112.)

(1) Admissions There were four patients admitted to the Orthopaedic Unit with conditions due to disorders of metabolism, growth or nutrition during the year 1948.

b. Type There were no patients admitted with post rachitic deformities. Perhaps the public health agencies have been so effective that there are no patients available for hospitalization. If there are, such patients in this locality they may be admitted elsewhere. There were two patients admitted with osteoporosis and one patient with osteogenesis imperfecta. In 1945 there were eleven patients admitted with conditions due to disorders of metabolism, growth or nutrition.

The distribution of the number of these patients admitted monthly or according to seasonal variation is not worth mention since the total number of admissions were extremely low. (See TABLE 47 , page 113 and TABLE 48 , page 114.)

c. Surgical Operations Performed. (See TABLE 49 , page 115.)

The only patient in this group to be operated on was the one with osteogenesis imperfecta who had a bone graft to the tibia from his mother's iliac crest - a rare but novel operation.

TABLE 46.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO DISORDERS OF METABOLISM, GROWTH, OR NUTRITION

YEARS 1945 and 1948

Condition	Number of Patients Admitted 1948	1945
1. Chondrodysplasia	-	4
2. Deformities following		
rickets	-	-
scurvy	-	-
3. Epiphyseal Disturbance	-	4
4. Osteitis Deformans	1	-
5. Osteitis Fibrosa Cystica	-	2
6. Osteogenesis Imperfecta	1	-
7. Osteoporosis	2	1
TOTALS	4	11

Source: Patients Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 47.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO DISORDERS OF METABOLISM, GROWTH, OR NUTRITION

YEARS 1945 and 1948

Month	Number of Patients Admitted	
	Year 1948	Year 1945
January	-	-
February	-	1
March	-	1
April	-	-
May	-	4
June	-	-
July	-	-
August	-	4
September	1	-
October	2	-
November	1	1
December	-	-
TOTALS	4	11

Source: Patient Records and Daily Ward Census Reports at the Massachusetts General Hospital

TABLE 48.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH DISORDERS OF METABOLISM, GROWTH OR NUTRITION ACCORDING TO SEASONAL VARIATION

YEARS 1945 and 1948

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	-	-	1	3#
1945	2	4#	4#	1

#Greatest number of patients admitted during the year specified.

Source: Computed from TABLE 47, page 113.

TABLE 49.

TYPES OF OPERATIONS

PERFORMED ON PATIENTS ADMITTED TO THE

ORTHOPAEDIC UNIT DUE TO METABOLISM,

GROWTH OR NUTRITION DISORDERS

YEAR 1948

Condition	Operation	Number of Operations	Number of Patients with Conditions
Osteogenesis Imperfecta	1. Bone graft to tibia from mother's iliac crest	1	
		1	1

Source: Patient Records and Operating Room Records of the Massachusetts General Hospital

3E Findings and Interpretation of Data Concerning Patients Admitted to the Orthopaedic Unit With Conditions Due to New Growth

a Amount

(1) Admissions (See TABLE 50, page 118.)

A total of thirty-five patients were admitted to the Orthopaedic Unit with conditions due to new growths in 1948. This was an increase of six patient admissions over the 1945 count.

The monthly distribution of admissions during 1948 showed that there were at all times more than one admission and less than six. (See TABLE 51, page 119.) Seasonal variation in the number of admissions was not remarkable. (See TABLE 52, page 120.)

b Type (See TABLE 50, page 118.)

Bone cysts were included in this classification. There were four of them. Of the thirty-one patients admitted with tumors one-half of them were malignant and the other half benign. Eight (8) or one-quarter of the patients with malignant tumors were those patients who had bone metastatic lesions resulting from a malignant condition elsewhere in the body.

c. Age Grouping (See TABLE 53, page 121.)

All groups were represented except 0-1 year and 91-100 years. The older age groups (from sixty years of age and older)

were well represented. The metastatic tumors belong to this group primarily. In the 14-30 year age grouping, forty per cent of the cases were recorded. This majority was, in part, due to the inclusion of patients admitted with ganglia in this classification.

c. Surgical Operations Performed (See TABLE 54, pages 122 and 123.)

The thirty-five patients admitted had forty-seven operations performed which were of the variety of biopsies and excisions. Only one amputation was performed.

TABLE 50.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO NEW GROWTH

YEARS 1945 and 1948

Condition	Number of Patients Admitted	
	Year 1948	Year 1945
1. Cysts (bone)	4	1
2. Tumors		
Liposarcoma	-	1
Osteochondroma	4	7
Osteogenic Fibroma	3	3
Osteogenic Sarcoma	4	-
Osteoid Osteoma	1	1
3. Metastatic Tumors (involving bone)	8	1
4. Miscellaneous Tumors including ganglia and neuroma	11	16
TOTALS	35	29

Source: Patient Records and Daily Ward Census Reports of the Massachusetts General Hospital

TABLE 51.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO NEW GROWTHS

YEARS 1945 and 1948

Month	Number of Patients Admitted	
	Year 1948	Year 1945
January	2	1
February	1	1
March	2	2
April	5	2
May	1	0
June	5	4
July	5	0
August	5	7
September	3	2
October	1	4
November	2	2
December	3	4
TOTALS	35	29

Source: Patient Records and Daily Ward Census Reports at the Massachusetts General Hospital

TABLE 52.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO NEW GROWTHS ACCORDING TO SEASONAL VARIATION

YEARS 1945 and 1948

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	5	11	13 #	6
1945	4	6	9	10 #

#Greatest number of patients admitted during the year specified.

SOURCE: Computed from TABLE 51, page 119.

TABLE 53.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO NEW GROWTHS ACCORDING TO AGE GROUPING YEARS 1945 and 1948

Age in Years	Patients Admitted	
	Number	Per Cent
0 - 1	-	-
1 - 13#	2	5.72
14 3-	14	40.00
31 - 45	3	8.57
46 - 60	8	22.85
61 - 75	6	17.14
76 - 90	2	5.72
91 - 100	-	-

Patients 0 13 years of age are considered children according to hospital census standard.

Source: Patient Records of the Massachusetts General Hospital

TABLE 54.

TYPES OF OPERATIONS

PERFORMED ON PATIENTS ADMITTED TO THE

ORTHOPAEDIC UNIT WITH CRIPPLING CON-

DITIONS DUE TO NEW GROWTHS

YEAR - 1948

Condition	Operation	Number of Operations	Number of Patients with Conditions
Cysts (bone)	1. Exploration of knee excision of fat pad	1	
	2. Excision of cyst	2	
	3. Bone graft to cystic area	1	
		4	4
Osteochondroma	1. Excision of osteochondroma	3	
		3	4
Osteoid Osteoma	1. Excision of osteoid osteoma	1	
		1	1
Osteogenic Fibroma	1. Excision of osteofibroma	2	
	2. Biopsy	2	
	3. Mid-thigh amputation	1	
		5	3

Condition	Operation	Number of Operations	Number of Patients with Conditions
Ganglion	1. Excision of ganglion (wrist)	3	
	2. Excision of ganglion (shoulder)	1	
	3. Excision of ganglion (foot)	3	
		7	7
Tumors (mixed)	1. Biopsy (bone and muscle)	11	
	2. Excision of tumor (hand)	1	
	3. Excision of tumor (scapula)	1	
	4. Excision of cutaneous tumor (thigh)	1	
	5. Excision of tumor (tibia)	2	
	6. Excision of tumor (femur)	2	
	7. Excision of neuroma	2	
	8. Excision of osteoma	1	
	9. Aspiration biopsy	2	
	10. Excision of rib	1	
		24	16

3E. Findings and Interpretation of Data Concerning Patients With Conditions Due To All Other Causes - Including Unknown and Uncertain Causes

a. Amount (See TABLE 55, page 126.)

(1) Admission

There were 116 patients admitted who had conditions listed within this classification. This was an increase of twenty admissions over that of 1945.

Monthly admissions ranged from seven to fifteen patients with a monthly average of 9.66 patients. The seasonal variation was not distinctive. (See TABLE 56, page 127 and TABLE 57, page 128.)

b. Type Patients with rheumatoid arthritis and degenerative joint disease headed the list in 1946. They made up forty-one per cent of the total number. Responsible for this majority is the fact that (1) many of these patients were admitted for the purpose of having the cup arthroplasty operation which was devised by Dr. Smith-Peterson, the former Chief of the Orthopaedic Department and has been routinely carried out by his colleagues and students for selected patients suffering from orthopaedic conditions due to rheumatoid arthritis; and (2) the Commonwealth of Massachusetts makes provision for the hospital care of a certain number of patients with rheumatoid arthritis or orthopaedic conditions resulting therefrom. (See page 19.) Next in frequency of admission numbers were those patients with hallux valgus, scoliosis and slipped femoral epiphysis

respectively.

c. Age Grouping

Because some of the conditions in this classification were studied in relation to age grouping later in this study it was deemed unnecessary to review them at this time.

d. Surgical Operations Performed (See TABLE 58, pages 129-130.)

A total of 114 operations were performed on the 116 patients admitted. The greatest number of operations were done for patients with rheumatoid arthritis. (See TABLE 59, page 131.)

It appears that operations of major importance and interest were performed on patients in this classification among which were laminectomy and spinal fusion, nailing of slipped femoral epiphysis, cup arthroplasty, obturator neurectomy and excision of bone from mother for grafting to child.

TABLE 55.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO ALL OTHER CAUSES# - INCLUDING UNKNOWN AND UNCERTAIN CAUSES

YEARS 1945 and 1948

CONDITION	Number of Patients Admitted Year 1948	Year 1945
1. Arthritis Including		
Rheumatoid and Degenerative Joint Diseases	48	44
2. Hallux Valgus	23	15
3. Hallux Rigidus	1	2
4. Hammer Toe	3	6
5. Myositis Ossificans	3	-
6. Neurological Disorders	4	-
7. Osteochondritis Dessicans	3	-
8. Pes Cavus	-	4
9. Pes Planus	-	1
10. Scoliosis	12	7
11. Slipped Femoral Epiphysis	12	16
12. Miscellaneous Conditions		
Donor for Bone Grafting	3	-
Ingrown Toe Nail	1	-
Progressive Muscular Dystrophy	1	-
Slipped Rib Syndrome	-	1
Trigger Finger	1	-
Undiagnosed Case	1	-
Total	116	96

See list of conditions under Classification #VI, p. 70.

Source: Patient Records and Daily Ward Census Reports at the Massachusetts General Hospital

TABLE 56.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT WITH "ALL OTHER" CONDITIONS# - INCLUDING UNKNOWN OR UNCERTAIN CAUSES

YEARS 1945 and 1948

Date	Number of Patients Admitted Year 1948	Year 1945
January	10	7
February	8	10
March	7	14
April	9	6
May	15	11
June	11	9
July	8	7
August	14	6
September	7	5
October	11	8
November	9	7
December	7	6
Totals	116	96

See List of Conditions Under Classification #VI, p . 70.

Source: Patient Records and Daily Census Reports of the Massachusetts General Hospital

TABLE 57.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO ALL OTHER CAUSES - INCLUDING UNKNOWN AND UNCERTAIN CAUSES ACCORDING TO SEASONAL VARIATION

YEARS 1945 and 1948

Year	Patients Admitted			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1948	25	35	29	27
1945	31	26	18	21

#See list of conditions under Classification #VI, p. 70 .

Greatest number of patients admitted during the year specified.

Source: Computed from TABLE 56, page 127.

TABLE 58.

TYPES OF OPERATIONS PERFORMED ON PATIENTS ADMITTED TO THE ORTHOPAEDIC UNIT WITH CONDITIONS DUE TO ALL OTHER CAUSES INCLUDING UNKNOWN OR UNCERTAIN CAUSES

YEAR - 1948

Condition	Operation	Number of Operations	Number of Patients with Conditions
Arthritis			
Rheumatoid Degenerative Joint Disease	#	53	48
Hallux Valgus	1. Resection and tendon lengthening	17	
	2. Osteotomy	3	
	3. Excision of Hallux valgus	1	
	4. Sling repair	1	
		22	23
Hallux Rigidus	1. Tendon transplant and plastic	1	
		1	1
Hammer Toe	1. Arthrodesis of second right toe	1	
	2. Repair of hammer toe	2	
	3. Repair of hammer toe and excision of neuroma	1	
		4	3
Osteochondritis Dessicans	1. Resection of the metatarsal head	1	
	2. Arthrotomy knee	2	
		3	3

Condition	Operation	Number of Operations	Number of patients with Conditions
Scoliosis	1. Laminectomy and spinal fusion - bone grafting	9	
		9	13
Slipped Femoral Epiphysis	1. Epiphyseal Grafting	1	
	2. Nailing	9	
	3. Closed reduction	1	
	4. Removal of a Nail	1	
		12	12
Miscellaneous Donor for bone grafting	1. Excision of bone for grafting (mother to children)	3	
		3	3
Myositis Ossificans	1. Muscle transplant	2	
	2. Biopsy of muscle	1	
		3	3
Ingrown toe nail	1. Excision of ingrown toe nail	1	
		1	1
Neurological Disorders			
Manifestations of spasticity	1. Obturator neurectomy	1	
	2. Released contractures	1	
	3. Nerve crushing	1	
		3	4

#See page 131, for types of operations performed on patients who have rheumatoid arthritis.

Source: Operating Room Records of the Massachusetts General Hospital

TABLE 59.

TYPES OF OPERATIONS PERFORMED ON PATIENTS WITH RHEUMATOID ARTHRITIS AND DEGENERATIVE JOINT DISEASES

YEAR - 1948

Condition	Operation	Number of Operations	Number of Patients With Condition
Rheumatoid Arthritis	1. Arthrodesis (ankle and wrist)	7	
	2. Arthroplasty		
	elbow	1	
	hip		
	Arthro-plasty	1	
	cup arthroplasty	17	
	cup arthroplasty revision	6	
	removal of cup (post-arthroplasty	1	
	inter phalangeal joint	1	
	metatarsal head	1	
	shoulder	1	
	ulnar	1	
	3. Aspiration	1	
	4. Biopsy	2	
	5. Manipulation	5	
	6. Miscellaneous		
	Excision		
	nodules on hand	1	
	synovial membrane	1	
	neuroma from arthrodesis scar	1	
	sequestrum	1	

Condition	Operation	Number of Operations	Number of Patients With Conditions
	Graft		
	dermatome-skin	1	
	Injection		
	Intraspinal block	1	
	Novocaine-hips	1	
	Osteotomy		
	Spine	1	
	Totals	53	48

Source: Patient Records and Operating Room Records at the Massachusetts General Hospital

IV Clinical Resources in the Orthopaedic Department by the Out-Patient Department

The Orthopaedic Clinic

There were 8,357 patient visits made to the Orthopaedic Clinic in the Out-Patient Department during the year 1948. This amount shows a decrease in the total number of patient visits when compared with those of 1945, 1946 and 1947. (See TABLE 60 , page 136.) Nevertheless there were 920 patients making their first visit and 1,964 patients referred to this clinic from other clinics or General Hospital Services for diagnosis and/or treatment which suggests that a very live clinic is in operation. (See TABLE 60 , page 136.)

The Special Orthopaedic Clinics (See TABLE 61 , page 137 and TABLE 62 , page 138.)

The Special Orthopaedic Clinics of the Out-Patient Department are called the Anterior Poliomyelitis, Scoliosis and Posture, Cerebral Palsy and Miscellaneous Clinics. There was a total of 847 patient visits in 1948 which was less than the patient visits in 1946 and 1947. (See TABLE 62 , page 138.) In comparing the patient visits to these Special Orthopaedic Clinics during the years 1947 and 1948 it appears that there is a decrease in the number of patients visits, both initial and repeat, in each of these clinics except in the Miscellaneous Clinic during the year 1948. (See TABLE 62, page 138.) There were more patient visits to the Anterior

Poliomyelitis Clinic during both years 1947 and 1948 than to any of the other Special Orthopaedic Clinics. Yet the number of new cases or patients making their initial visit is at a relatively low level probably because New England in general and Massachusetts are extremely fortunate in avoiding any serious epidemics of anterior poliomyelitis in the past number of years. Should an epidemic occur, this Clinic is prepared to assume its share and participate in the care of those affected. The Children's Hospital in Boston has a large follow-up Clinic for victims of anterior poliomyelitis. This also may, in part influence the number of patients who are admitted to the Clinic at the Massachusetts General Hospital.

Only two patients with cerebral palsy made their initial visit to the Clinic in 1948. Ten (10) patients with cerebral palsy were admitted to the Clinic in 1947.

The Fracture Follow-Up Clinic

The physicians in this Clinic have attended more than 2000 patient visits every year since 1945 to the present. (See TABLE 63, page 139.)

The End-Result Clinics

Fracture (See TABLE 64, page 140.)

There has been a Fracture End-Result Clinic in operation for many years which has proven very successful from the standpoint of evaluation of treatment and research. From 200 to 300 patients have been seen each year since 1945.

The Orthopaedic and Special Orthopaedic End-Result Clinics

These are in their early beginning. They have been in operation for two years. (See TABLE 65 , page 141, and TABLE 66 , page 142.) A report of these Clinics is included to suggest the clinical resources which might be available therein. (See pages 143-145.)

TABLE 60.

DISTRIBUTION OF AMOUNT OF PATIENT VISITS MADE TO THE ORTHOPAEDIC CLINIC IN THE OUT-PATIENT DEPARTMENT ACCORDING TO FIRST, REPEAT AND REFERRAL VISITS

YEARS 1945 - 1948

Year	Patient Visits			
	First	Repeat	Referral #	Total
1948	920	5473	1964	8357
1945	865	8432	-----	9278
1946	948	8269	-----	9217
1947	938	7505	647	9090

Records of referrals were not kept during the years 1945 and 1946

"Referral" means that patients cared for in other clinics or General Hospital Services were referred to the Orthopaedic Clinic for diagnosis and/or treatment.

Source: Annual Reports of the Orthopaedic Service and Orthopaedic Clinic Records at Massachusetts General Hospital

TABLE 61.

TOTAL NUMBER OF ADMISSIONS AND PATIENT VISITS TO THE SPECIAL ORTHOPAEDIC CLINICS IN THE OUT-PATIENT DEPARTMENT

YEARS 1945 - 1948

Year	Total Patients Admitted	Total Patient Visits
1948	----#	847
1945	400	775
1946	405	982
1947	----#	1095

#Records were kept of patient visits only in 1947 and 1948.

Source: Annual Reports of the Orthopaedic Service at the Massachusetts General Hospital

TABLE 62.

NUMBER OF PATIENT VISITS TO THE SPECIAL ORTHOPAEDIC CLINICS IN THE OUT-PATIENT DEPARTMENT ACCORDING TO INITIAL AND REPEAT PATIENT VISITS

YEARS 1947 and 1948

Condition	Anterior Poliomyelitis		Scoliosis		Cerebral		Miscellaneous#	
	Patient Visits		Patient Visits		Patient Visits		Patient Visits	
	Initial	Repeat	Initial	Repeat	Initial	Repeat	Initial	Repeat
Year								
1948	20	352	18	238	2	40	7	170
1947	25	411	43	374	10	44	30	158

#Miscellaneous refers to patients with varied special diagnoses who are being followed by certain Orthopaedists.

Source: Annual Reports of the Orthopaedic Service of the Massachusetts General Hospital

TABLE 63.

TOTAL NUMBER OF PATIENT VISITS TO THE FRACTURE FOLLOW-UP CLINIC OF THE OUT-PATIENT DEPARTMENT YEARS 1945 - 1948

Year	Total Number of Patient Visits
1948	2313
1945	2003
1946	2586
1947	2645

Source: Annual Reports of the Fracture Service of the Massachusetts General Hospital

TABLE 64.

TOTAL NUMBER OF PATIENTS REPORTING TO FRACTURE END-RESULT CLINIC# OF THE OUT-PATIENT DEPARTMENT

YEARS 1945 - 1948

Year	Total Number of Patients Reporting
1948	302
1945	268
1946	289
1947	212

#Patients who have suffered a fracture or fractures are requested to make one visit to this Clinic one year following hospital discharge for evaluation.

Source: Annual Reports of the Fracture Service of the Massachusetts General Hospital

TABLE 65.

TOTAL NUMBER OF PATIENTS REPORTING TO ORTHOPAEDIC END-RESULT CLINIC OF THE OUT-PATIENT DEPARTMENT

YEARS 1945 - 1948

Year	Total Number of Patients Reporting
1948	118
1945	-#
1946	-#
1947	166

#No records available.

Source: Annual Reports of the Orthopaedic Service of the Massachusetts General Hospital

TABLE 66.

COMPARISON OF NUMBER OF PATIENTS REQUESTED TO RETURN
AND PATIENTS REPORTING TO THE END-RESULT CLINICS
AT THE OUT-PATIENT DEPARTMENT
YEAR 1948

Clinic	Patients Sent For	Patients Reporting	
	Number	Number	Per Cent
Orthopaedic End-Result	179	94	25.00
Special End-Result	50	24	49.00
Totals	229	118	74.00

Source: Annual Report of the Orthopaedic Service of the Massachusetts General Hospital

REPORT OF ORTHOPAEDIC MED-RESULT CLINIC

1948

Combined Diagnoses:

Osteomyelitis	Result	Number
Tibia	2 excellent	2
Femur	4 exc.;1 good;1 poor	6
Spine	1 excellent	1
Ilium	1 good; 1 excellent	2
Sacro-iliac	1 excellent	1
		12
Congenital Torticollis	4 excellent	4
Old Poliomyelitis		
Shoulder	1 excellent	1
Foot	1 good; 1 excellent	2
Wrist	Deferred	1
Hand	1 failure;1 deferred	2
		6
Ruptured Disc	3 excellent; 1 good	4
Malum Coxae Senilis	1 exc.;1 good; 1 fair	3
Scoliosis	2 deferred; 1 fair	3
Knees		
Ruptured semi-lunar cartilage	2 good	2
Traumatic synovitis	Deferred	1
Prepatellar bursitis	1 excellent	1
Cyst, med. collat. lig.	1 excellent	1
Osteocartilaginous, loose bodies	1 excellent	1
Torn medical meniscus	1 excellent	1
Old septic knee	1 excellent	1
Slipping patella	1 good	1
		9

Combined Diagnoses	Result	Number
Feet		
Hallux Valgus	5 exc.; 2 fair 1 poor; 1 def.	9
Accessory scaphoids	1 excellent;1 good	2
Calcaneo-valgus	1 good	1
Osteochondrosis 2nd metatarsal	1 poor	1
Hallux rigidis	1 poor	1
Neuroma, foot	1 deferred	1
Hammer toes	1 good	1
Club foot	1 good	1
		17

Total: 58

Miscellaneous Diagnoses:

13 excellent results; 16 good results; 1 fair result; 6 deferred results. Total 36

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REPORT OF SPECIAL ORTHOPAEDIC END-RESULT CLINICS - 1948

Diagnosis: Rheumatoid Arthritis

Operation: 1 Arthroplasty of the elbow:

4 patients sent for; 2 reported. One good result; one excellent result.

2 Metatarso-phalangeal joint resection:

17 patients sent for; 9 reported. Results: One excellent; three good; one fair; one poor; three deferred (difficult to evaluate.)

Miscellaneous Diagnosis (including rheumatoid arthritis)

Operation: Cup Arthroplasty

1st Clinic: 7 patients reported; 3 excellent results; 4 good results.

2nd Clinic: 6 patients reported; 2 excellent results; 3 good results; 1 fair result.

V. CLINICAL PROGRESS IN THE DEPARTMENT OF PHYSICAL MEDICINE

This department functions primarily as a service unit for patients needing occupational and physical therapy as well as those specialized diagnostic procedures which are so necessary in relation to neuromuscular function. This department provides many and various types of physical treatment such as massage, hydro therapy, electro therapy, mechano therapy, etc. It is well organized with adequately trained personnel under competent medical supervision. In a very recent report[1] Dr. Arthur L. Watkins, Chief of the Physical Medicine Department stated:

"Some changes have been observed during the past eighteen months in relation to the types of problems for which patients are referred to the department. For example, there has been an increased awareness of the importance of preparing patients to meet the needs of daily activities at home before they are discharged.--------Convalescent exercises are being utilized to greater extents in selected cases, and more and more patients are being referred to us to learn to walk properly or use whatever apparatus is necessary before their discharge. A striking example of this is in relation to the Amputation Clinic which includes representatives from the Orthopedic and Surgical

1 Watkins, Arthur L. "Physical Medicine Affairs", The Massachusetts General Hospital News, 77:1, March 1949.

Services, the Physical Medicine Department, and Social Service. Efforts are being made to see that patients are properly prepared for use of prostheses and are taught to use them when provided. The State Department of Rehabilitation, also, regularly refers such patients to us for these services.------- There has also been a distinct increase in the number of industrial accident cases sent to the department for both qualitative evaluation of function and for treatment to hasten rehabilitation.

In Occupational Therapy the number of patients treated has shown a slight increase.------- Many of our patients receive both physical and occupational therapy in a progressive fashion, particularly following disease or injuries involving locomotion or use of the hands. This represents the first step toward rehabilitation.------- Vocational guidance and prevocational training in many instances should begin in the hospital as a part of the total medical care of the patient, and it is in this direction that we see a new avenue of growth in the Physical Medicine Department of this hospital."

(For overall figures in relation to admissions to this Department see TABLE 67, page 148, TABLE 68, page 149, and TABLE 69, page 150.)

TABLE 67.

DISTRIBUTION OF AMOUNT OF TREATMENT VISITS TO THE DEPARTMENT OF PHYSICAL MEDICINE ACCORDING TO HOSPITAL PROVISIONS REFERRING PATIENTS

YEARS 1945-1946-1947-1948

Hospital Division Referring Patients	Treatment Visits							
	Year 1945		Year 1946		Year 1947		Year 1948	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Out-Patient Department	6779	42	7028	36	8747	35.3	8306	37.0
General Hospital and Eye & Ear Infirmary	5508	34	6067	31	6811	27.9	5685	25.5
Baker Memorial	1998	12	2867	14	3341	13.5	3727	16.5
Phillips House	516	3	748	4	1013	4	860	4.0
Private Ambulatory	1464	9	1720	8	3227	13	3894	17.0
Staff			1132	6	1582	06.3	-	-
Totals	16265	100	19562	100	24721	100.0	22472	100.0

Private patients who were not hospitalized

Treatment visits by Staff not recorded in 1945 or 1948

Source: Annual Reports of the Department of Physical Medicine of the Massachusetts General Hospital

TABLE 68.

DISTRIBUTION OF AMOUNT OF NEW PATIENTS# REFERRED TO THE DEPARTMENT OF PHYSICAL MEDICINE ACCORDING TO HOSPITAL SERVICES REFERRING THESE PATIENTS

YEARS 1945-1946-1947- 1948

Hospital Service Referring Patients	New Patients Referred for Physical Therapy							
	Year 1945		Year 1946		Year 1947		Year 1948	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Orthopaedic	542	41	896	46	884	46	908	41.0
Medical	347	26	271	19	297	23	518	23.2
Neuro-Psychiatric	182	14.2	152	14.3	134	12	342	15.3
Surgical	78	6	83	9	91	10	277	12.4
Fracture	89	6.7	129	6	128	5.7	133	6.0
Skin	68	5	100	5	59	2.7	4	2.0
Eye, Ear, Nose and Throat	15	1.1	9	0.7	13	.6	5	.1
Totals	1321	100.0	1640	100.0	1606	100.0	2228	100.0

#These patients were referred from the General Hospital and the Out-Patient Department only.

Source: Annual Reports of the Department of Physical Medicine of the Massachusetts General Hospital

TABLE 69.

DISTRIBUTION OF AMOUNT OF TREATMENTS GIVEN BY THE OCCUPATIONAL THERAPISTS ACCORDING TO HOSPITAL DIVISIONS REFERRING THEIR PATIENTS

YEARS 1945-1946-1947-1948

Hospital Divisions Referring Patients	Occupational Therapy Treatments							
	Year 1945		Year 1946		Year 1947		Year 1948	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Out-Patient Department	464	4.6	504	5	730	7	490	5.0
General Hospital	9574	91.0	8428	89	8796	87.9	9235	89.4
Baker Memorial	325	3.1	461	4.5	175	1.7	136	1.4
Phillips House	55	0.5	57	.5	40	.4	26	0.2
Private Ambulatory#	83	0.8	116	1	329	3	463	4.0
Totals	10501	100.0	9564	100.0	10070	100.0	10330	100.0

Private patients who were not hospitalized

Source: Annual Reports of the Department of Physical Medicine

VI. Clinical Resources in the Emergency Ward (See TABLE 70, page 151.)

The Emergency Ward operates on a twenty-four hour basis. It is well equipped to meet major emergencies both in type and amount. Steadily have the numbers of patients admitted with fractures risen since 1945. In 1948 there was an increase of 212 patients over the total fracture admissions in 1947.

TABLE 70.

TOTAL NUMBER OF PATIENTS ADMITTED WITH

FRACTURES TO THE EMERGENCY WARD #

YEARS 1945 - 1948

Year	Total Number of Cases Admitted
1948	839
1945	537
1946	628
1947	627

There is one Emergency Ward in the whole hospital; therefore, patients may be transferred from it to any one of the hospital divisions which offer care to the patient with an orthopaedic condition.

Source: Annual Reports of the Fracture Service of the Massachusetts General Hospital

Analysis of Data

In order to analyze these data in the light of the needs of the professional nurse's basic clinical experience it seems mandatory

A. to review the aims and objectives of modern Orthopaedic Nursing instruction and practice, and

B. to determine what constitutes clinical resources adequate in kind and amount to achieve these aims and objectives.

A. The Aims and Objectives of Modern Orthopaedic Nursing

Very broadly and simply stated one might say that an attempt is being made to provide the professional nurse with the necessary tools with which she may achieve the full armamentarium of a professional nurse in the field of Orthopaedic Nursing. This, then would imply that she should be so equipped with such knowledge, skill and appreciations so that she would be capable of fulfilling her responsibilities in relation to the:

1. preventing of crippling conditions,
2. finding of the potential or actual crippled child and adult
3. care (immediate and continuous) of the crippled child and adult
4. treatment (immediate and continuous) of the crippled child and adult

5. education of the crippled child and adult

6. placement of them in the "Life of the World".

Another way of outlining the above is the method used in "A Curriculum Guide for Schools of Nursing" which suggests that "the purpose of this unit (Nursing in Conditions of the Musculo-Skeletal System) is to familiarize the nurse with orthopaedic conditions which will be met in the community; to develop an appreciation of the social and economic waste resulting from such conditions; to give an understanding of the effect of physical crippling on the mental and emotional states of the individual, and to acquaint her with methods of prevention and treatment used in such disabilities".[1]

B What constitutes adequacy in the clinical resources available for the basic clinical experience of the professional nurse in Orthopaedic Nursing?

Patterned after the "Fundamental Requirements" set up by "the American College of Surgeons for Graduate Training in Surgery and the Surgical Specialties",[2] and

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1 National League of Nursing Education. Committee on the Curriculum. A Curriculum Guide for Schools of Nursing. New York: The League, 1937, p. 426.

2 American College of Surgeons, Directory of Graduate Training Programs in General Surgery and the Surgical Specialties in Hospitals of the United States and Canada Chicago: The College, 1946 p. 9-11.

the "Guide for an Advanced Clinical Course in Orthopedic Nursing"[1] and "A Curriculum Guide For Schools of Nursing."[2] the following criteria to determine the adequacy of the clinical resources available for the basic clinical experience and practice of the professional nurse were established.

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1. National League of Nursing Education. Subcommittee on Orthopedic Nursing. Guide for an Advanced Clinical Course in Orthopedic Nursing. New York: The League, 1948, p. 3.

2 National League of Nursing Education. Committee on the Curriculum. A Curriculum Guide for Schools of Nursing. New York: The League, 1937, p. 426.

Criterion #I

1. Are these clinical resources available for experience in an institution which

a is approved by appropriate accrediting or policy making authorities?

b provides service, education and professional leadership?

c maintains an active Orthopaedic Service operating in a segregated or non-segregated unit or units within a general hospital?

d includes an Operating Room, an Emergency Ward, a Department of Physical Medicine and Social Service which have been organized under medical supervision and staffed by personnel with preparation approved for these specialties?

e operates an organized Orthopaedic out-patient department with systematic follow-up and end-result clinics for the care of regular and special types of orthopaedic patients?

Analysis of the findings concerning the data gathered revealed that the clinical resources available on the Orthopaedic Unit of the Massachusetts General Hospital for the basic clinical experience of the professional nurse favorably met criterion #I. For evidence see pages 13 to 23.

Criterion #II

Do these available clinical resources offer opportunity for observation and experience in a wide variety of orthopaedic conditions so that the basic professional nurse may acquire

an acceptable degree of proficiency in nursing patients of all age groups who are afflicted with orthopaedic conditions due to prenatal influences, infections, trauma and physical agents, disorders due to metabolism, growth or nutrition, new growths and all conditions due to unknown or uncertain cause?

In other words are there patients in all age groups with a wide variety of common orthopaedic conditions available at all times on this Orthopaedic Unit to offer experience to the nurse in all those basic experiences which are fundamental in the total nursing care of the patient with an orthopaedic problem?

In order to determine whether or not these clinical resources met needs listed in Criterion #II it was necessary to make further analysis utilizing the following approach:

1. Was there a wide variety of common orthopaedic conditions available?
2. Did the variety of orthopaedic conditions meet the standards set up by the National League of Nursing Education in A Curriculum Guide for Schools of Nursing?[1]

   These standards include a Master List of those conditions of the Musculo-Skeletal System which are essential for the basic clinical experience of the nurse

1 National League of Nursing Education. Committee on the Curriculum. A Curriculum Guide for Schools of Nursing, New York: The League, 1937, p. 426.

2a What did this variety of orthopaedic conditions show in relation to the kind and amount when analyzed according to a new suggested list of conditions which might be used as a guide or a Master List?

3. Were these orthopaedic conditions available for care in all age groups?

4. Were those conditions which were considered essential for the basic clinical experience of the nurse present and available at all times, some of the time or not at all?

5. In accordance with the thinking of a group of experts who made the publication "An Activity Analysis of Orthopaedic Nursing" possible, do clinical resources available on this Orthopaedic Unit measure up to their concept of those activities which are necessary for the wholesome basic experience of the professional nurses.

1. Analysis to determine the presence of a wide variety of common orthopaedic conditions produced the following:

a. It was evident that during the year 1948 there were over 550 patients admitted to the segregated Orthopaedic Unit. This number of patients represented a wide variety of orthopaedic conditions from which the nurse was afforded opportunity for observation and practice. (See Page 25 to 152.)

2. When this wide variety of patients admitted was compared with the Master List of Conditions of the Musculo-Skeletal System prepared and published by the National League of Nursing Education in A Curriculum Guide For Schools of Nursing[1] and considered "essential for experiences necessary for student Nurses on the Orthopedic service"[2] there were some omissions in the available clinical resources recorded. (See TABLE 79 , pages 162 and 163.)

The same omissions appeared in the year 1945 admission records with one exception (that of flat foot).

It was noted that two of the omitted conditions, hernia and rachitic deformities, were considered as "practice essential" in the "A Curriculum Guide for Schools of Nursing".[3]

The omission of hernia is understood since it is a well established policy of the Massachusetts General Hospital to care for patients with hernia on the General Surgical Unit. Absence of patients with congenital and rachitic deformities suggests that these conditions usually associated with and considered essential in the

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1 National League of Nursing Education, Committee on the Curriculum. A Curriculum Guide for Schools of Nursing. New York: The League, 1937, p. 574 .

2 Ibid., p. 569 .

3 Ibid., p. 574 .

care of children (See Master List including conditions essential in the care of children pages162 and 163.) may have some bearing on the majority age groups admitted. Omission of these patients from the lists for essential experience suggests investigation of their presence or absence elsewhere within the hospital or its associated agencies.

After working with this "Master List" which has been the main standby for most of the Schools of Nursing in the country it was discovered that it was difficult to make a good analysis by using this "Master List" alone since (a) it is twelve years old: (b)it wasn't constructed according to any pattern or distribution except an alphabetical one; (c)it was not possible to list all the patients admitted under the headings provided; and (d) last and most important, that within the past decade there has been marked interest and progress in recognizing the types of crippling conditions which constitute medical, nursing and public health problems, "and in broadly interpreting the total needs of the disabled, physical, mental, and social. Some of the forces responsible for this growth in public understanding are the widespread expansion of state programs for

crippled children due to federal funds made available through the Social Security Act, and educational and public information activities of organization such as the National Society for Crippled Children and Adults and The National Foundation for Infantile Paralysis, Inc. Recent developments which have highlighted the value of prevention as well as rehabilitation are early bed activity and ambulation to offset the harmful effects of bed rest, the reconditioning program of the Army, and the growing problem of the chronically ill including the geriatric group".[1]

Hence it was felt that this analysis should proceed further on the basis of the findings concerning the data gathered in relation to the kind and amount of clinical resources available as they were classified previously in this study according to:

(a) service admitting the patients; and

(b) cause of the patients' orthopaedic condition

and that a new list be devised which might act as a Guide or Suggested Master List of Orthopaedic Conditions considered essential in the care of children and adults for the practice of the professional nurse during her basic clinical experience. (See pages 164-166 for this list.)

1 National League of Nursing Education. Sub Committee on Orthopaedic Nursing. Guide for an Advanced Course in Orthopaedic Nursing. New York: The League, 1948. p. 1.

TABLE 71.

DISTRIBUTION OF NUMBER OF PATIENTS ADMITTED MONTHLY TO THE ORTHOPAEDIC UNIT ACCORDING TO MASTER LIST* OF CONDITIONS ESSENTIAL FOR EXPERIENCES NECESSARY FOR STUDENT NURSES IN THE ORTHOPAEDIC SERVICE

YEAR 1948

Conditions of the Musculo-Skeletal System	Number of Patients Admitted in Month of												Year	
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1948	1945
Amputations	1	1			1			1	1				5	2
Arthritis (C) X	4	4	3	3	7	5	4	3	2	2	7	5	49	50
Brachial Palsy (C) X	1												1	2
Bursitis	2	2	1		2			1					8	2
Congenital Deformities and Dislocations														
Absence of part (C)		1		1									2	
Club foot (talipes) X	1						1		1				3	
Dislocation of the hip (C) X	2	1	2	1	1	1		3	1	3	1	2	18	6
Sprengel's Deformity														
Wry Neck (Torticollis) (C) X		2				2	1		1			1	7	3
Coxa plana (Legg's Disease) (C)	1			2	3	1	1	2		1		1	12	16
Coxa valga (C)														
Coxa vara (C)														
Deformities														
Post poliomyelitis (C) XX	1		3	3	1	3	3	1	3	2	1	1	22	6
Rachitic (C)														

Conditions of the Musculo-Skeletal System	Number of Patients Admitted in Month of												Year 1948	Year 1945
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Dislocations (C)		1		2									3	
Flat Foot														1
Fractures (C)	22	16	24	30	16	22	13	24	17	16	26	17	238	225
Hallux valgus (C)		3	2	1	3	2	1	2	3	5	1		23	15
Hallux Varus (C)			1										1	
Hammer Toe	1			1		1							3	0
Hernia (C)														
Myositis		1				1						1	3	0
Neoplasms														
Benign	2	1		3	1	4	3	2	1				18	17
Malignant			2	2		1	2	3	2	1	2	2	17	12
Osteomyelitis (C)XX	2	4	5	3	6	1	3	4	5	4	6	3	46	73
Periostitis (C)														
Posture defects (C)XX	2			2	2		1	4		1			12	7
Sacro Iliac Strain							1	1	2			1	5	34
Spastic Paralysis	1	1				1						1	4	2
Sprains (C														
Synovitis														
Tenositis (C)														
Tenosynovitis (C)													1	2
Tuberculosis (C)X														
Bones		1					1				1	1	4	7
Joints	1	2				2				1			6	8
Volkmann's Ischemic Paralysis									1				1	2

(C) listed as essential in the care of children with orthopaedic conditions
(c)X practice highly important, if available (C)XX practice essential
Practice essential, if available in care of the adult
Practice highly important, if available in care of the adult
\# Taken From "A Curriculum Guide for Schools of Nursing - National League of Nursing Education. Committee on the Curriculum. New York: The League, 1937. Pages 574, 583-84 .

Source: Daily and Monthly Census Reports and Patient Records of The Massachusetts General Hospital

A Suggested List of Orthopaedic Conditions Considered Essential For the Practice of the Professional Nurse In the Care of Children and Adults During Her Basic Clinical Experience

Conditions Due to

I Prenatal Influence

A Deformities

1. Club foot
2. torticollis
3. spina bifida
4. Sprengel's Deformity
5. coxa valga
6. coxa vara

B Dislocation

a hip

C Paralysis

a obstetrical

b cerebral spastic

II Infection

A 1. osteomyelitis

2. tuberculosis (bone and joint)

B Paralysis

1. residual paralysis from anterior poliomyelitis

III Trauma or Physical Agents

A Types

1. Amputation
2. Bursitis
3. Dislocation
4. Fractures

5. Injury to soft tissues surrounding joints

6. Internal Derangements of the Knee

7. Ruptured Intervertebral Disc

8. Sprain

9. Strain

10. Volkmann's Ischemic Contracture

IV Disorders of Metabolism Growth or Nutrition

A. Types

1. osteoporosis

B Deformities

1. post-rachitic

V New Growth

A. Tumors

1. Malignant

a. osteogenic

b metastatic

2. Benign

ganglia

VI All Other Conditions Including Unknown and Uncertain Causes

A Mechanical defects of the feet

1. pes planus
2. pes cavus
3. hallux valgus, varus and rigidus
4. hammer toe

B. Deformities due to

1. Arthritis

2. degenerative joint disease

C. Mechanical defects of the vertebrae

1. Scoliosis

D. Coxa plana - (Legg's disease)

2a When this wide variety of patients admitted was analyzed on the basis of those classified according to admitting service and according to The New List classified according to the cause of their condition it was apparent that the nurse was offered opportunity for observation and practice in the care of patients with orthopaedic conditions admitted by both services - Orthopaedic and Fracture. While the amount of admissions and surgical operations by the Orthopaedic Service was greater than that by the Fracture Service, the large number admitted yearly, monthly and quarterly by the Fracture Service was indicative of the volume of opportunities available in relation to prevention, treatment, continuous care and other nursing responsibilities inherent in the nursing of patients with fractures and other trauma. (See pages 47 to 66 and Figure III, page 51.)

Therefore in the year 1948 opportunities were available to the nurse during her basic clinical experience to become acquainted with orthopaedic conditions which will be met within the community". Such was essentially true in 1945 also. (See pages 71 to 152, and Figure VI , page 75 .) which were included in the hospital admission records of an Orthopaedic Unit and among those conditions listed as essential for the experience

necessary for student nurses on the Orthopaedic Service.

3. It was evident, after a thorough analysis of age groupings of the patients admitted during the year 1948 that all age groups were represented except infants and centenarians, and that at some times there was not even one child with an orthopaedic disability available to offer to the nurse experience in the care of children with orthopaedic conditions. (See page 28.) The number of children admitted, the child patient days treatment and the patient census reviewed in relation to the needs of the nurse were determined inadequate in kind and amount. (See TABLE 4, page 29, TABLE 5, page 31, Figure I, page 32, TABLE 17, page 55, and Figure I, page 56.) This was especially true of those patients with orthopaedic conditions due to prenatal influence which, in light of present day standards, are necessary in relation to the care and treatment of crippled children. The greatest number of patients in the geriatric group were women between sixty and ninety-five years of age who had fractured their hip or hips. They alone, comprised thirty-four per cent of the total number of patients admitted with fractures. (See TABLE 44, page 108.) Thus, it may be repeated that "the population is living longer, especially the women who live longer to break their bones." (See page 57.)

An analysis to determine which clinical resources considered essential for the basic clinical experience of the professional nurse were available on the Orthopaedic Unit at all times, were not available at all times or not available at all during the Year 1948 showed the following:

Orthopaedic Conditions Due to	Column I Conditions Available At All Times	Column II Conditions Not Available At All Times	Conditions Not Available At Any Time
I Prenatal Influence	Congenital Dislocation of the Hip	Club Foot Torticollis Spina Bifida Cerebral Palsy Obstetrical Paralysis	Sprengel's Deformity Cox a vara Cox a valga
II Infection	Osteomyelitis Residual paralysis of anterior poliomyelitis	Tuberculosis (bones and joints) Bursitis	Acute infections arthritis Acute anterior poliomyelitis
III Trauma and Physical Agents	Fractures (hip (upper extremity (lower extremity Internal Derangements of the Knee Ruptured Intervertebral Disc	Amputations Injury to the soft tissues (ligaments, tendons, muscles) Fractures cervical vertebrae patella pelvic ring shoulder girdle	Sprains Fractures of the skull, nose and jaw
IV Disorders of Metabolism Growth or Nutrition		Osteogenesis imperfecta Osteoporosis	Deformities Due to Rickets
V New Growth	Tumors - Malignant and Benign		

VI	All other Causes - Including Unknown and Uncertain Causes	Rheumatoid Arthritis Hallux Valgus Scoliosis Slipped Femoral Epiphysis	Backstrain Dislocation Contractures Bursitis Hammer Toe	Mechanical Disabilities of the Feet - pes cavus pes planus hallux rigidus

Reviewing this analysis in light of the nurse's needs it is obvious that all the conditions considered essential were not present and available at all times or were not present at all during the year 1948. There is evidence to substantiate that the same was true during the year 1945. (See pages 162 and 163 .) Are these conditions available elsewhere in the hospital? The true answer to this important question can only come from further investigation of other hospital clinical resources.

5. In order to follow the general pattern described in the approach to the analysis of this problem of determining the adequacy of these clinical resources the next logical step which seems in order is to discover what nursing activities or problems present themselves among the variety of clinical available resources in order to insure competency in nursing these patients with orthopaedic conditions. "A Curriculum Guide" states that: "Nursing experience should include the care of patients on fracture beds and Bradford frames, in plaster casts, and with splints and braces and skin traction of various kinds, and should give practice in all the procedures which are fundamental in the nursing care of orthopedic patients. Emphasis should be placed on care of skin, back and feet. The preventive aspects and psychological

reactions of patients in each condition should be included."[1]

This is rather a broad statement and in an analysis of this kind it might be better to approach this whole situation by using "An Activity Analysis of Orthopedic Nursing"[2] in which the authors have attempted to "identify the activities most significantly related to orthopedic nursing, together with those activities common to other types of nursing care which have special significance in the treatment of patients with orthopedic conditions or in the prevention of crippling conditions."[3] Following this "Analysis" a list was prepared by experts which included the activities "which all professional nurses should be prepared to carry out and teach with respect to orthopedic conditions and their prevention."[4] The activities were listed under the following headings:

I. Preventing the Occurrence of Orthopedic Disability in Any Person and Assisting in the Early Recognition of Existing Orthopedic Conditions.[5]

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1 National League of Nursing Education, Committee on the Curriculum. A Curriculum Guide for Schools of Nursing. New York: The League, 1937. p. 427.

2 "An Activity Analysis of Orthopedic Nursing" The Nursing Education Bulletin. Bulletin 5; 1 - 25, July, 1943.

3 Ibid., p. 3.

4 Ibid., p. 3.

5 Ibid., p. 13.

II. "Assisting in Providing Continuous and Adequate Medical and Nursing Supervision of Patientw with Orthopedic Conditions."[1]

III. "Helping the Patient and Family to Adjust Psychologically to the Patient's Orthopedic Condition and to the Prescribed Treatment."[2]

IV. "Carrying out Nursing Care in Relation to the Orthopedic Condition."[3]

In light of the material contained in this "Activity Analysis" and analysis of the wide variety of orthopaedic conditions available on the Orthopaedic Unit for observation and practice, it became evident that there were available clinical resources which would allow the nurse to execute the following activities in the performance of her responsibilities in relation to the care of any one or all of this wide variety of patients in the adult group. These activities included:

I. Preventing the Occurrence of Orthopedic Disability in Any Person and Assisting in the Early Recognition of Existing Orthopaedic Conditions

A. Assisting in Teaching Health Habits

B. Aiding in the Prevention of Accidents

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1 Ibid., p. 15.

2 Ibid., p. 16.

3 Ibid., p. 17.

1. Teaching the handicapped person and his family to adjust to his limitations and to avoid accidents which might occur as a result of their negligence or thoughtfulness.

II. Assisting in Providing Continuous and Adequate Medical and Nursing Supervision of Patients with Orthopaedic Conditions.

III. Helping the Patient and Family to Adjust Psychologically to the Patient's Orthopedic Condition and to the Prescribed Treatment.

A. Assisting in Creating and Maintaining Wholesome Family Relationships, and Sound Social Relationships

B. Recognizing Signs of Mental Strain, Ascertaining Causes, and Instituting Measures to Assist in Preventing or Alleviating Mental Strain.

However in reviewing the other activities suggested as those which should be included in the use of the wide variety clinical resources it became evident that some of these activities were not available at all times or were not available at all. The first step then would be to discover which of these activities were available at all times. Therefore those orthopaedic conditions which were present at all times on the Orthopaedic Unit during the year 1948 (See Column I on page 169.) were again listed on TABLE 72, page 177 in order to gain some idea of the possible specific nursing activities which would be inherent in the care of these patients. Study shows that there is little doubt of the presence of clinical resources

which will offer experience in the care of many patients in different kinds of casts, braces and traction. Patients needing to learn to walk on crutches and using both corrective and therapeutic exercises are also available. It is evident that there is lack of experience available in the care of patients on frames. There were only two patients on Bradford frames and one patient on a Stryker Frame last year. The Foster Bed-Frame was not used. The relatively minor use of frames may be due to the small census of children with diagnosis requiring frames - such as congenital deformities and skeletal tuberculosis. There were eight patients who were put into corsets. This practice probably will increase since the tendency now is to place patients with spinal fusions performed because of a ruptured intervertebral disc into a corset rather than into a plaster shell. Since many frames are available for use it would be well to survey other resources of this hospital to see where and when they are used and if not to determine some method of supplying this lack in the students learning and practice. Using another student as a patient subject on these frames for practice in turning may be extremely helpful.

It might be well to point out here that in analyzing the clinical resources in light of the nurse's needs that the revolutionary change in the number of admissions, the seriousness of the illness and the change in the treatment of patients with both acute and recurrent osteomyelitis appear to be

reflected in the findings concerning osteomyelitis during the past four years. See TABLE 29, page 89, TABLE 30, page 90, TABLE 31, page 91 and Figure VIII, page 92. No doubt as was mentioned before, successful treatment with penicillin has been responsible for the decrease in the number of and type of operations. There were 56 operations in 1945 and eighteen in 1946. This, of course eliminates the necessity of doing the time-consuming dressings involving other elements such as "wound precaution" technique, open and closed drainage, or fractional irrigations. It should be remembered however, that since the "new" penicillin treatment has supplanted the "old" time-honored Carrel-Dakin, Baer and Orr Methods of treatment these should not be put aside or omitted from the student's learning experience with the idea that they are never used anywhere or that there might not be further use for them should the local population become "penicillin fast" or "penicillin resistant."

TABLE 72.

DATA GATHERED CONCERNING PATIENTS WITH ORTHOPAEDIC CONDITIONS WHICH WERE AVAILABLE AT ALL TIMES

YEAR 1948

Orthopaedic Conditions Due to	Condition	Number of Cases	Average Days Stay	Operated on	Not Operated On	Number of Operations	Age Range Under 13	Age Range Over 13	Sex M	Sex F	Casts	Traction	Frames	Braces	Corsets	Crutches	Exercises
Prenatal Influence	Congenital dislocation of the hip	18	26.83	12	4	16	8	10	1	17	4	12	1#*	-		10	12
Infection	Osteomyelitis	46	29.6	18	28	18	3	43	37	9	17	-	-				
	Residual anterior Poliomyelitis	22	23.5		2	20	4	18	12	10	18	-	-	3	2	12	20
Trauma and Physical Agents	Fracture	238	34.1				18	220	105	133	87	137	2#*	7		188	212
	Internal Derangement of the Knee	15	17.7	13	2	13	1	14	10	5	11	-	-	1	-	12	14
	Ruptured Intervertebral Disc	14	52	10	4	10	-	14	9	5	12	-	-	10	4	-	13
New Growth	Tumors Benign Malignant	31	16	24.	7	30	1	30		1	17	3	-	-	1	2	-
All Other Causes Including Unknown & Uncertain Causes	Rheumatoid Arthritis	48	45	68	12	53	-	48	19	29	14	27	-	2	-	27	44
	Hallux Valgus	23	14	22	1	22	1	22	3	20	-	-	-	-	-	22	19
	Scoliosis	12	34	7	5	8	1	11	0	12	9	-	-	3	1		4
	Slipped Femoral Epiphysis	12	21	12	-	12	1	11	11	1	1	9	-	1	-	2	-

Source: Patient Records of the Massachusetts General Hospital

*Patients on Bradford Frame

#Patient on a Stryker Frame

To give further evidence that many of the patients with orthopaedic conditions which are present and available at all times offer a large number of the activities listed in "An Activity Analysis" the following activity analysis has been recorded:

The following specific nursing activities may be utilized when caring for a patient who has had a hip cup arthroplasty operation. (See TABLE 73 , page 81, and TABLE 74, page 82.)

1. care of patient in balanced suspension traction
2. maintenance of the lower extremity in an abnormal position for therapeutic purposes.
3. exercises (done once or twice each waking hour)
   a. muscle setting
      (1) quadriceps
      (2) internal rotators
      (3) anterior tibials
      (4) abductors
      (5) gluteals
      (6) plantar flexors
4. assisting with the removal of sutures
5. administration of penicillin (unaffected hip)
6. removal of splint and traction
7. manipulation of bed to give needed hip flexion
8. reapplication of splint and traction
9. teach patient to roller skate (in bed)
10. use of bicycle
11. assisting a handicapped patient to chair from bed and from chair to bed

12. teach and prepare patient for use of walker

13. teach and prepare patient for use of crutches, effective use of rocking chair

14. teach patient stair walking

15. prepare patient for convalescent care at home

See "Post-operative Cup Arthroplasty Routine" carried out at the Massachusetts General Hospital which follows:

POSTOPERATIVE CUP ARTHROPLASTY ROUTINE

A. FIRST FOUR WEEKS:

1. Immediately after operation, the operated leg is placed in balance suspension traction with five pounds of weight. The leg should also be in maximum abduction and internal rotation. Penicillin should be given routinely 100,000 units every eight hours for five days.

2. Third day: Blood count is checked; portable x-rays taken to determine position of cup. Antero-posterior x-rays only are necessary.

3. Fourth day: Exercises started in the form of muscle-setting. This includes quadriceps, internal rotators, abductors and gluteal muscles. Also, patient is taught to dorsiflex the foot and at the same time, curl the toes. These exercises are done once or twice each waking hour.

4. Tenth day: Sutures removed.

5. Fourteenth day: For a period of fifteen minutes, morning and afternoon, the bed is elevated to give hip flexion as far as is tolerated. The patient is also encouraged to lie completely flat at night with the splint resting on bed to maintain hip extension.

6. Twenty-fourth day: (or thereabouts depending upon type of reconstruction) The splint is removed. Leg returned to splint at night.

7. Twenty-sixth day: Roller-skating exercises in bed is begun if patient's leg is comfortable out of splint.

8. Twenty-eighth day: Patient is allowed to stand putting both feet to the floor and to sit in chair for ten or fifteen minutes.

B. AMBULATORY ROUTINE DURING REMAINDER OF HOSPITAL STAY (Usually two weeks)

1. Patient is taught use of bicycle which he rides ten minutes twice a day.

2. Patient is taught use of walker and then transferred to crutches. Note: In unilateral cases, the crutches are used together with the operated leg
In bilateral cases, it is better to teach quadriped walking.

3. Rocking chair is used in such a way that it gains further flexion

4. Patient is taught stair-walking, foot after foot.

5. Average case will be dismissed from the hospital eight weeks post-operatively to carry on same routine at home.

C. CONVALESCENT CARE:

Patients will usually be seen in office check-ups once a month until examiner is satisfied that good habits are used and being formed and progress is satisfactory. In these visits, it is necessary to check the gait to keep it symmetrical. Check permanent flexion to keep it stretched.

Where necessary, at the end of the third month, resistive exercises can be added to gain strength in hip flexion and abduction. At this time, patients may also be taught side jumping and front-to-back jumping in place.

Between six to nine months, unilateral cases will be ready to start the use of the cane in the hand opposite the operated hip. At this time, they continue the bicycle exercises plus their jumping exercises and special exercises for quadriceps and gluteus medius. During this time, postoperative x-rays are checked approximately every three or four months for the first year.

This has been devised by the medical staff on the Orthopaedic Unit at the Massachusetts General Hospital.

TABLE 73.

NUMBER OF PATIENTS WHO HAD HIP CUP ARTHROPLASTY AND

REVISIONS OPERATION

YEAR 1948

Diagnosis	Number of Patients	Number of Operations	Average Days Stay	Age under 13 yrs	Age over 13 yrs	Sex M	Sex F
Rheumatoid Arthritis	9	11	112	-	-	3	5
Degenerative Joint Disease	7	8	75	-	7	6	-
Congenital Dislocation of the Hip	7	9	71	-	7 -	-	7
Old Fractured Femur	1	2	124	-	1	-	1

Source: Patient Records of the Massachusetts General Hospital

TABLE 74.

DISTRIBUTION OF AMOUNT OF CUP ARTHROPLASTY OPERATIONS#

PERFORMED MONTHLY

YEARS 1948 and 1945

Date	Year 1948	Year 1945
January	2	1
February	3	2
March	3	2
April	3	-
May	4	1
June	3	2
July	1	1
August	1	1
September	2	2
October	4	2
November	2	4
December	2	1

These operations refer to Initial Cup Arthroplasty and Revisions of Cup Arthroplasty Operations

Source: Patient Records and Operating Room Records at the Massachusetts General Hospital

Routine for Patients Who Have Had a Spinal Fusion

A Preoperative Care.

1. Depends on patients diagnosis

a. Scoliosis

(1) preoperativety patient is in cast or Risser Jacket for 6 - 8 weeks

(2) window may be cut in cast or it may be bivalved just before operation

b. Ruptured Intervertebral Disc and Unstable Spine

(1) myelogram

(2) plaster shells made

c. Tuberculosis of the Spine

(1) patient may be in case, brace or hyper-extended frame

(2) plaster shells made

B Post-operative Care (See TABLE 75, page 184)

1. Includes all diagnosis

a. Patient remains in plaster shell or corset for six weeks

(1) never allow patient out of either anterior or posterior plaster shell

(2) turn patient in shell at least three or four times daily

(3) keep shell clean and dry

b Patient fitted to brace in six weeks

(1) exercise routine

(2) discharge and return to clinic

TABLE 75.

DATA CONCERNING PATIENTS WHO HAD SPINAL FUSION

YEAR - 1948

Diagnosis	Number of Patients	Number of Operations	Average Days Stay	Age Under 13yrs	Age Over 13yrs	Sex M	Sex F	In Cast	In Corset
Scoliosis	7	9	80	1	6	-	7	7	-
Ruptured Intervertebral Disc	9	9	55	-	9	6	3	7	2
Tuberculosis of Spine	2	2	63	-	2	-	2	2	-
Unstable Spine	2	2	75	-	2	2	-	1	1

It would be a lengthy process to list the number of nursing activities involved in the care of the patients who have undergone the different maneuvers carried out in the surgical management of the many patients who have had fractures. Endless activities may be recorded by careful study of TABLE 21, page 65. In 1948 there were forty-six patients who had hip nailing for fractured femur. A routine for these patients will follow. This is but one example of the numerous possibilities for nursing practice.

Routine for Patients Who Have Had Nailing Performed for the Treatment of a Fractured Femur.

Pre-operative Care

1. patient in traction (skin or other)
2. surgical preparation

Post-operative

1. patient in traction for two weeks
2. then up and around
3. Use of walker
4. exercises (bicycle and other)

or

1. patient in traction for a few days
2. return home for a few weeks
3. return to hospital to learn to walk on crutches

Thorough study shows that at all times most of the activities listed in An Activity Analysis of Orthopedic Nursing[1] are available for nursing practice in the care of adult orthopaedic patients especially in relation to those activities listed under the following headings

IV Carrying Out Nursing Care in Relation to the Orthopedic Condition

A. Observing and Reporting Signs, Symptoms and Reaction to Treatment

B. Explaining the Orthopedic Situation to the Patient and Family

C. Giving Orthopaedic Nursing Care surgical and non surgical

D. Carrying Out Medical Recommendations

E. Maintaining the Effectiveness of the Orthopedic Appliance."[2]

The exceptions to this are:

1. those elements of nursing care which are peculiar to crippled children and their families.
2. those activities which are peculiar to the care of certain patients who are not present and available at all times such as

1 "An Activity Analysis of Orthopedic Nursing" The Nursing Education Bulletin; Bulletin 5. July 1943. pp. 1-28 .

2 Ibid., pages 13-32.

a. giving care to a patient in a respirator

b. teaching the patient the proper use of the artificual limb

c. care of patients on frames

3. those activities in relation to methods of treatment which are not in common usage at this hospital on the Orthopaedic Unit.

such as

a. giving heliotherapy

b. assisting, encouraging, and directing the patient in carrying out medical instructions, such as gold therapy, sera, or vaccines, which may be used in relation to orthopedic conditions

4. those activities which are carried out by the personnel in the Department of Physical Medicine such as

a. giving light or lamp treatments

b. giving paraffin baths.

Summary of Limitations of the Study

The conclusions and recommendations can probably be better understood if the limitations of the present study are again reviewed.

It was not the purpose of this study to analyze all the orthopaedic conditions at the Massachusetts General Hospital, but to ascertain whether or not the segregated Orthopaedic Unit provided the nature and extent of orthopaedic nursing problems satisfactory for the preparation of professional nurses for practice in this field, on a safety minimum level anywhere in the country. If deficiencies are discovered, the school will need to examine the resources elsewhere in the institution to ascertain if supplemental experiences can be provided or if it will have to seek them elsewhere. Some of the sources which might yield information on supplemental experiences available have been pointed up such as the Orthopaedic Out-Patient Department, the Orthopaedic Operating Room, the Department of Physical Medicine, the Neurosurgical, Pediatric, Medical, and General Surgical Units.

The study made no attempt to compare the orthopaedic conditions on the segregated Orthopaedic Unit with the present needs of the industrial area in which the hospital is situated. It is fully recognized that in preparing professional nurses, the prevalence and frequency of community diseases should be taken into account.

In lieu of an analysis of the community, was substituted the kinds of experience deemed essential by persons competent to judge as indicated in the published reports of national nursing organizations. Since these decisions were based on nationwide discovered needs, they appear to be even more desirable and valid than would local needs alone.

CHAPTER III

CONCLUSIONS

Following a careful study of the clinical resources on the Orthopaedic Unit of the Massachusetts General Hospital during the year 1948 in relation to the basic clinical experience of the professional nurse the writer concluded that:

1. there were clinical resources available for observation and practice in Orthopaedic Nursing on the Orthopaedic Unit of the Massachusetts General Hospital
2. there were other orthopaedic clinical resources available in (a) the Orthopaedic Out-Patient Department which has systematic regular and special follow-up and end-result clinics to which patients return for examination and ultimate determination of end results; (b) a well organized and extensive emergency accident ward where patients present themselves for the treatment of accidents and other emergencies; (c) an operating room where a number and variety of surgical procedures were performed; (d) a Department of Physical Medicine which provided various types of physical treatment in the care and especially the rehabilitation of patients handicapped by orthopaedic conditions
3. these clinical resources are available within an institution which provides service, education, and professional leadership and is approved of by appropriate accrediting or policy making authorities.

4. the available clinical resources on the Orthopaedic Unit which were studied specially represented a wide variety of patients (both surgical and non surgical) who were admitted to this segregated Orthopaedic Unit by either the Orthopaedic or Fracture Service for the purpose of correction of congenital and acquired deformities and for the treatment of fractures and other acute and chronic conditions which interfered with the proper functioning of the musculo-skeletal system and its associated structures.
5. this wide variety of patients with orthopaedic conditions was present and available for nursing practice at all times during the year. Neither the monthly nor seasonal variation in the patient census showed marked distinction between one or the other. The Orthopaedic Service admitted more patients yearly than the Fracture Service. Yet the Fracture Service was responsible for a large proportion of the patient admission totals during every month and season of the year. This is contrary to the common belief concerning the occurrence of fractures in relation to higher hospital admission and census figures during the winter and early spring months
6. there were at all times available for orthopaedic nursing care both men and women with a wide variety of orthopaedic conditions. There was no great variation in sex incidence, even though the patient admission totals showed that there were more women admitted than men the margin of majority was

never great enough to be significant.

7. all age groups were represented in the wide variety of patients admitted with orthopaedic conditions except infants and centenarians.

8. there were not enough patients either in amount or variety admitted within the child age grouping available at all times to offer to the professional nurse experience in the care of children with orthopaedic conditions during the basic clinical experience, according to modern standards.

9. among this wide variety of patients admitted with orthopaedic conditions to the Orthopaedic Unit there were included in the main those adult patients with specific conditions which are considered essential for the professional nurse during the basic clinical experience. There were exceptions to this. Some of these patients with such conditions were available at all times, some were available part of the time and some were not available at all.

10. there was a group of adult patients with orthopaedic conditions due to various causes who were considered essential for the basic clinical experience needs of the professional nurse and who were available for observation and practice at all times. The nursing of these adult patients included with relatively few exceptions those various nursing activities "which all professional nurses should be prepared to carry out and teach with respect to orthopedic

conditions and their prevention"[1] following a well directed and supervised basic clinical experience in the Massachusetts General Hospital.

1 An Activity Analysis of Orthopedic Nursing. The Nursing Education Bulletin: Bulletin 5. July, 1943, p. 3

Recommendations

On the basis of the conclusions reached as a result of this study it is recommended that:

1. the basic curriculum including the formal class room and ward teaching of Orthopaedic Nursing be critically examined in the light of these findings and conclusions in order to improve the quality of teaching and service.
2. the patients with orthopaedic conditions who were found to be available at all times and in sufficient numbers be used as a basis for revising the list of nursing activities and procedures which every professional nurse should have sufficient practice in during her basic clinical experience to insure competency in nursing the patient with the orthopaedic condition.
3. since many nursing activities are available in this Orthopaedic Unit which are also an integral part of the care of patients who are in other non-orthopaedic hospital units joint planning should be considered so that an economy of time and effort in teaching will be effected. In other words the ward teaching including demonstration and practice of such procedures as cast care, crutch walking, and traction which is necessary in the care of so many other patients throughout the hospital may be offered not only to the students on the Orthopaedic Unit alone but also to students on the other Services who have need of

this experience.

4. this study be continued to consistently evaluate the successful accomplishment of the objectives of instruction and practice in orthopaedic nursing and to keep up with changing methods of and particular emphasis in the treatment of certain orthopaedic conditions as they relate to the nursing activities and problems contained therein.

5. Some of the not so common orthopaedic conditions or nursing problems associated with same which are not considered essential for practice in the basic clinical experience can be discussed by conference methods, use of moving pictures and other visual aids or a vicarious type of experience may be offered.

6. In view of the fact that there were patients of all age groups admitted to the Orthopaedic Unit that the Supervisor, Head Nurse and other teaching personnel should be well-prepared in the pediatric and most certainly in the geriatric aspects of Orthopaedic Nursing in order that they may offer the best kind of care to these patients and the best kind of teaching to the nurse.

7. The nursing problems encountered in the care of patients with orthopaedic conditions considered essential but not always available be analyzed to ascertain if similar nursing problems are encountered in the care of any other type of condition, so that the necessary learning can be provided through experience with other types of patients.

Further study is recommended in

1. other hospital units which offer care to patients with orthopaedic conditions or conditions which have orthopaedic implications in order to determine the presence or absence of the conditions or nursing opportunities which are not available at all times or which are not available at all on the Orthopaedic Unit so that the basic clinical orthopaedic experience of the nurse may be supplemented if necessary. Suggested areas for further study are: the Medical Unit for acute rheumatoid arthritis, the Surgical Unit for amputations and injuries and other conditions of the soft tissue, the research ward for rare conditions due to faulty bone metabolism, growth or nutrition and lastly the Neuro Surgical Unit for patients with fractured skull and vertebra - especially those who might use the Stryker Frame or other frames the lack of the use of which was evident in this study.
2. this matter of the lack of adequate clinical resources in relation to experience in the care of children with orthopaedic conditions. Out of this further study should come a proposal for developing a larger Orthopaedic Unit for the care of children with crippling conditions; or a proposal to the hospital administration seeking that it take the responsibility to reserve a certain number of beds for children with such orthopaedic conditions that would provide

the necessary opportunities for a worthwhile basic clinical experience for the professional nurse in the Orthopaedic field; or, if it is not possible to conduct an acceptable program in this area what kind of satisfactory arrangement could be made for affiliation?

Since the study shows a wealth of adult clinical resources available for nursing observation and practice in the Orthopaedic Unit at the Massachusetts General Hospital it is recommended that this study may be used:

1. As a basis for considering this Orthopaedic Unit as a field for affiliation for the professional nurse's clinical experience in the care of adult patients suffering from conditions of the musculo-skeletal system.
2. As a basis for considering this Orthopaedic Unit as a field for a part of the advanced clinical experience of the orthopaedic nurse specialist. (Since this Unit has been used by graduate professional nurses as a field for advanced orthopaedic clinical practice it might be well to use this study for evaluation - using those standards set up by the National League of Nursing Education as a guide in "An Advanced Clinical Course In Orthopedic Nursing."[1]

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1 National League of Nursing Education. Subcommittee on Orthopedic Nursing. Guide for an Advanced Clinical Course in Orthopedic Nursing, New York: The League, 1948, p. 3 .

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